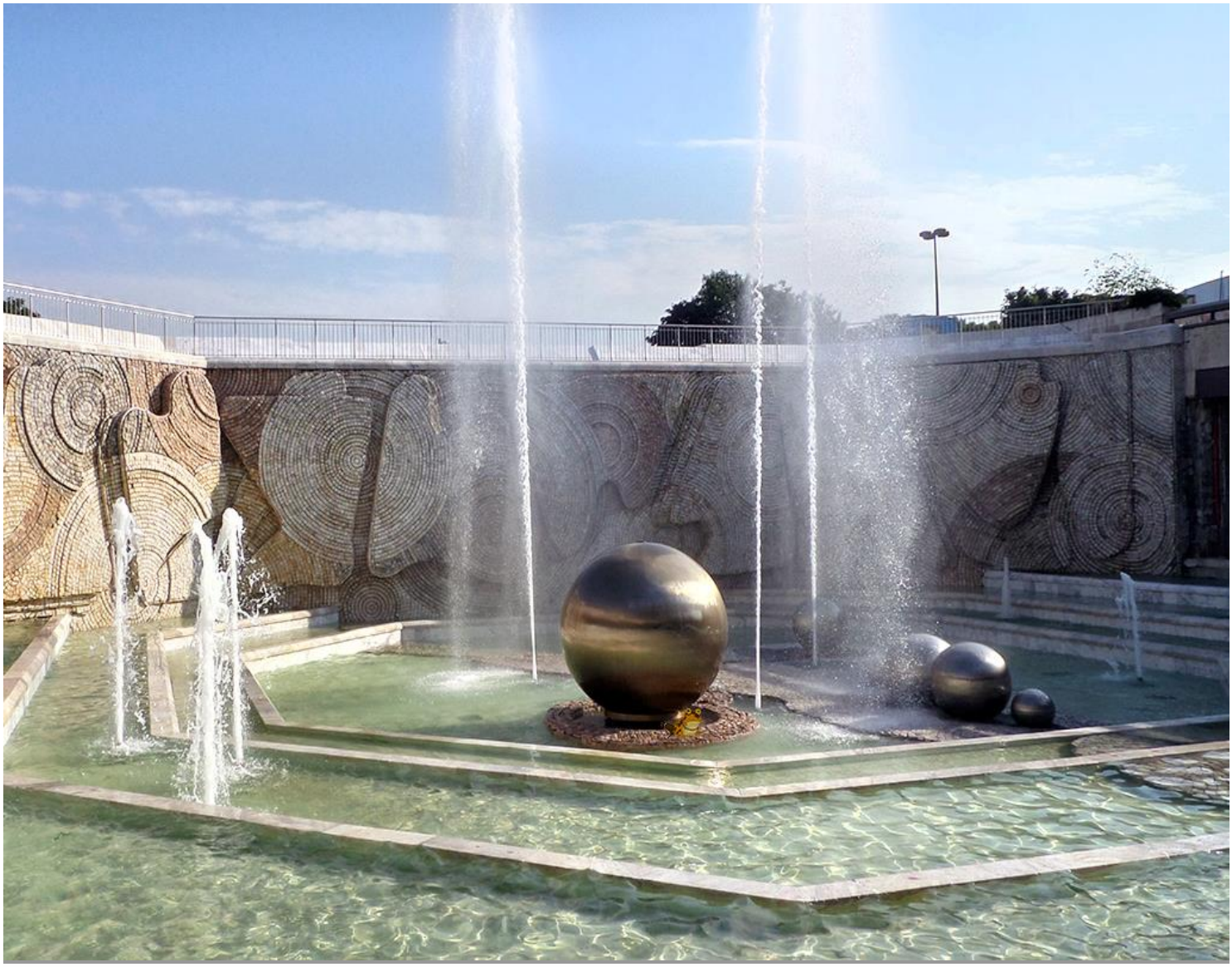


Софийска вода

част от VEOLIA

BUSINESS PLAN
„SOFIYSKA VODA“ JSC
2017 - 2021

Contents

All envisaged measures comply with the current statutory requirements for energy efficiency, seismic stability and occupational health and safety. They aim at making the building complaint

I. GENERAL PART

INTRODUCTION

The business plan for the period 2017 – 2021 is a strategic document for Sofiyska Voda, which on one hand describes the main activities of the company for the new regulatory period, while on the other hand identifies the key challenges the company will face. The document illustrates the direct correlation between the levels of the key performance indicators for WSS services, the investment program and the price of water and sewerage services, as a change in each of these components automatically leads to a change in the other components.

Sofiyska Voda started preparing the Business Plan 2017-2021, based on the current legislation and in accordance with the Ordinance on regulating the quality of water supply and sewerage services, Ordinance on regulating the prices of the water supply and sewerage services and the instructions for their application, as well as the individual levels of key indicators for quality of water and sewerage services, adopted at a meeting of the Energy and Water Regulatory Commission (EWRC) on 22.06.2016.

When preparing the business plan of the company, the fact that Sofiyska Voda operates as the only public-private partnership in the WSS sector in Bulgaria is taken into account. For this reason, in the preparation and implementation of the business plan, the company should be guided not only by the requirements of the legislation, but also the need to take into consideration the contractual obligations of the company set in the Concession Agreement and the conversations and discussions held with the Municipality of Sofia and the EWRC.

Sofiyska Voda submitted its draft Business Plan 2017-2021 to MoS and the Regulator on 30.06.2016 in compliance with the legal requirements. Following the submission of the Business plan, the EWRC requested further information in connection with its review by the experts from the Commission. The information was prepared and submitted to the EWRC, and this additional information was sent to MoS, as well. On November 11th 2016 a meeting between the Regulator and Sofiyska Voda was held where technical and financial aspects of the prepared document were commented and the necessity of correction of some of the reports in the BP. This updated BP takes into consideration the information that has been exchanged between SV and the EWRC so far, as well as the understanding that were reached between the parties at the meeting held on 11 November 2016.

1. GENERAL DATA

1.1. General data on the company

Sofiyska Voda JSC is a joint stock company, registered in the Commercial Register of the Registry Agency with UIC 130175000. The headquarters and registered address of the Company is 1766 Sofia, Mladost 4 R.Q., №1 Business Park Sofia St., building 2A. The Company has a one-tier management system, the Board of Directors comprising of 7 members. Sofiyska Voda JSC is a registered personal data controller with reg. № 3-1008168/01.12.2003 from the Commission for Personal Data Protection.

1.2. DESCRIPTION OF THE WSS SYSTEMS – WATER SUPPLY

1.2.1. Water sources

The water sources for the Municipality of Sofia (MoS) are Iskar Dam, Beli Iskar Dam, Vitosha catchments and alternative water sources.

Iskar Dam

As per the Urban Development Master Plan, Iskar Dam is multiannual compensating basin with a total volume of 655,300,000 m^3, as its maintained operational volume is around 570,000,000 – 630,000,000 m^3. The dam ensures the water supply to around 80% of the territory of the Municipality of Sofia through the impounding structures to the PWTP Bistritsa and Pancharevo.

Alternative water source in case of decommissioning of Iskar Dam is Kokalyane dyke.

Also, derivation Skakavitsa-Dzerman is planned as a reserve water source for Iskar Dam, which through the tunnel 'Vada' transfers water volumes to Cherni Iskar River, respectively to Iskar Dam. The mentioned derivation encompasses 7 water catchments. These facilities are in bad operational condition and transfer of water volumes could be realized only after the performance of serious repair works. To date this derivation is not an alternative for the water supply to Sofia Municipality.

Beli Iskar Dam

As per the Urban Development Master Plan, Beli Iskar Dam is a high-mountain seasonal (one-year) compensation basin with existing (useful) volume of 15,300,000 m^3, constructed in 1949. The dam is located on the territory of Samokov Municipality in the Rila Mountain.

From Beli Iskar dam starts the constructed so-called Rila water main. Apart from the dam, water volumes are supplied to Rila water main also from a few river catchments within the catchment area of the dam – the Beli Iskar River, the Levi Iskar River, emergency water catchment of Levi Iskar, Cherni Iskar, Preka Reka (along Cherni Iskar River). Reserve water sources are the river catchments Pavlovitsa and Lopushnitsa.

In critical situations of lack of enough water, emergency transfer of water volumes is allowed from the derivations Granchar and Manastirski, operated by the Dams and Cascades enterprise with the NEC EAD.

Status of Beli Iskar Dam

At the signing of the Concession Agreement for the provision of WSS services on the territory of the Sofia Municipality, Beli Iskar Dam had the status of public municipal property.

In 2010 Appendix 1 to art.13, item 1 of the Water Act was amended and supplemented (SG, issue 61 from 2010), and under number 5a Beli Iskar Dam was added, with which it became public state property.

Following the amendment to the legislation, the interested parties – the owner (the Ministry of Regional Development) and the user (the Municipality of Sofia) stated different opinion on the commitments of the user, respectively the concessionaire in terms of the implementation of activities, which are to improve the seismic stability of the facility. In view of the different opinions of the owner and user, the Energy and Water Regulatory Commission (the Commission) does not consider that the Company has any imposed obligations to implement measures for the improvement of the seismic stability of Beli Iskar wall.

As at the time the present business plan is developed, with the Order of the Sofia District Governor No.OA–97/04.04.2016 an interinstitutional working group was set up, and one of its tasks is ‘to specify and allocate the responsibilities of the parties for the implementation of investment projects related to the rehabilitation of Beli Iskar wall and to prepare an indicative schedule for their implementation’. Due to the difference in the opinions of the institutions and the position of the Commission, in Business Plan 2017-2021 the Company does not plan any investment measures for the rehabilitation of the dam wall.

Potable water supply from other water sources

There are individual areas on the territory of the Municipality of Sofia, which are supplied with water from local water sources, as follows:

- The village of Vladaya and the village of Marchaevo are supplied with water from the river catchments of Vladayska River and the catchments Tri Kladentsi, Turska Vada and Selimitsa located within the area of Torfeno Branishte in Vitosha;

  In 2016 the WSS operator worked actively on the implementation of an investment project, with which the water network in the village of Vladaya will be connected to the central water system. This project is expected to be finalized in 2017 with the construction of the pumping station Vladaya and water pipes to the existing reservoir. The water supply to the village of

Marchaevo will continue to be from catchments. With the implementation of the project in Vladaya one of the main requirements of the European legislation in the sphere of water will be met – not to supply water to customers from surface water sources without preliminary treatment of the potable water, and also the cases of increased turbidity and shortage of water will be limited, which are characteristic for the local water sources.

- The village of Klisura is supplied with water from the catchment Klisura (Varloe Usoe); the catchment is with insufficient flow and in periods of peak consumption (summer and winter periods), in the village of Klissura a water regime is in place;
- Water volumes are supplied to reservoir Boyana from the catchment Svetena Voda;
- The territory around the Dragalevski Monastery is supplied with water from the catchment Pasha Bunar;
- Chalets on the territory of Vitosha are supplied with water from the river catchment Kamenno Zdanie;
- Till 2013 the village of Zhelyava was supplied with water from a local water source – river catchment Zhelyavska Reka. After an investment project was implemented by the WSS operator, the village of Zhelyava is connected to the Sofia water system through the constructed new PS Zhelyava (at Yana reservoir) and rising main, and the river catchment is kept as a reserve water source.

Sources for industrial water

An individual water system for supply of industrial water to enterprises is established on the territory of the Municipality of Sofia. The system starts from Pancharevo dyke with diameters Ø1400 from 1977 and Ø1200 steel from 1963 through the residential quarters Lozeto, Gorublyane and Druzhba 2.

From Momina Cheshma in Druzhba 2 R.Q. the system splits into two branches:

- Water pipe Ø1000/900/800 steel, Ø546 asbestos cement supplying water to the Industrial area Gara Iskar where TPP Sofia-Iztok is supplied with water;
- Water pipe Ø1200/1000, crossing the residential quarters Druzhba 2, Druzhba 1, Hristo Botev, Vassil Levski, Malashevtsi, Orlandovtsi. There are two branches in Orlandovtsi, Ø850 steel and Ø700/300 steel (supplying water to TPP Sofia), and then it continues with decreasing diameters Ø700/500/400 steel through the residential quarters Lev Tolstoy, Svoboda and Iliyantsi (it ends in Iliyantsi r.q.).

The total length of the system is around 47 800 m, it is constructed of steel in the period 1961-1996.

The overall operational condition of the system for industrial water supply (non-potable water) is bad. The most critical section is the section from the water main Ø1000 steel from 1978, passing between Druzhba 1(Christopher Columbus Blvd.) and Hristo Botev R.Q. (Sabi Dichev St). Almost 3000 m of the water main passes fully out of the regulation and the street routes, which strongly impedes the access to the construction equipment.

Over the recent years a decrease has been observed in the consumption of industrial water, resulting to a great extent from the decreased raw water consumption on the territory of the MoS. As a result, to date the main consumers of industrial water are TPP Sofia-Iztok and TPP Sofia, using more than 95% of the total water supplied.

1.2.2 Facilities for potable water treatment

The water from Iskar Dam is processed in three potable water treatment plants – PWTP Pancharevo, PWTP Bistritsa and PWTP Passarel. The water from Beli Iskar Dam is processed in PWTP Mala Tsarkva.

PWTP Pancharevo (elevation 675 m), with capacity of 4.5 m^3/s. In case of increased volumes, 5.00m^3/s can be processed. It treats water from the derivation Passarel (4.5 m^3/s design capacity).

Apart from the derivation Passarel, the PWTP Pancharevo has two alternative connections – peak emergency connection Ø1800 steel (5.0 m^3/s design capacity) and connection from derivation Iskar, Ø1000 steel (design capacity of around 3.5 m^3/s).

The PWTP Pancharevo was commissioned in 1968. The plant has two stages of treatment, through pulsators and sand filters. To date the pulsators are not in operation in line with their design purpose and the basins are used as primary settling tanks.

PWTP Bistritsa (elevation 735 m) was constructed at the first stage with capacity of 6.75 m^3/s. The final planned capacity is 13.5 m^3/s. It treats the water from derivation Iskar (design capacity of 13.5 m^3/s).

The PWTP Bistritsa is supplied with water through the derivation Iskar and there are no alternative connections. The plant has one stage and it is constructed in the period 1990-1999. It was commissioned in 1999.

In case of continuous stop of the operation of the PWTP Bistritsa, due to the lower elevation of PWTP Pancharevo, the PS Bakston is used, which is used as a reserve option.

To date no equalizing reservoir has been constructed at the outlet of the PWTP Bistritsa to eliminate the hydraulic pulsations observed during the operation. For this

purpose the WSS operator carried out studies and developed a model of the operation of the treatment plant.

On the grounds of these studies a decision was made to restore the operation of Pod Simeonovo reservoir, which can replace the construction of a compensating reservoir at the outlet of the PWTP Bistritsa and perform in parallel its design functions as a reserved volume for Mladost region and Studentski region. The WSS operator implements a project for the commissioning of the reservoir.

Within ISPA program with the EC a **local PWTP** was constructed for the **village of Dolni Passarel.** It was commissioned in 2011.

Within the same program the **PWTP Mala Tsarkva** was also constructed, which ensures the mechanical treatment of the water volumes along the Rila water main.

The PWTP Mala Tsarkva was commissioned in 2011. The plant has net capacity of 2.0 m^3/s (172 800 m^3/day) and it is designed for automatic and manual regime.

The technical data of the potable water treatment facilities are provided in *Appendix No.1*.

1.2.3. Impounding structures

The pressure tunnel starts from the water intake tower of Iskar dam, 380 cm, with a total length of 5 665 m. A steel water pipe Ø1800 starts from the tunnel, around 990 m long. This water main has a connection at the equipment chamber Passarel with the derivation Iskar and also at the water tower of HPP Passarel with the derivation Passarel. These facilities are public state ownership and they are maintained and operated by Dams and Cascades enterprise with the NEC EAD.

A steel water pipe Ø150 is constructed after the pressure tunnel 380 cm, which supplies water to the PWTP Passarel.

The derivation Iskar starts from the equipment chamber Passarel – pressure tunnel 275 cm, around 12 930 m long. A steel water pipe Ø1800 from 1999 starts from the tunnel, around 2 070 m long, which supplies the PWTP Bistritsa.

From the derivation Iskar (steel water pipe Ø1800 from 1999) and emergency connection for the PWTP Pancharevo was constructed – steel water pipe Ø1000, around 2 320 m long.

The derivation Passarel starts from the water turbine of the HPP Passarel – pressure tunnel P-160/200 cm and P-154/200 cm with a total length of around 8 220 m. Through the territory of Kokalyane r.q. the derivation was constructed of steel water pipes Ø1100 and Ø1350, with a total length of around 5 230 m.

From the water tower of the HPP Passarel to the PWTP Pancharevo a peak emergency connection was constructed – steel water pipe Ø1800 from 1975, with a total length of around 4 070 m.

The facilities from the equipment chamber Passarel/ HPP Passarel are public municipal property, which are operated and maintained by the WSS operator as part of the total public municipal WSS infrastructure of the MoS.

The Rila water main is with design capacity of 2.1 m^3/s. This capacity, however, cannot be reached due to the fact that the designed second pipe was not constructed at two of the syphons. With the existing facilities, around 1.3 – 1.5 m^3/s can be supplied along the water main.

The Rila water main was commissioned in 1933, and it was constructed from tunnel Ø2000, P-165/145 cm and P-150/185 cm. In certain sections a steel pipe Ø1100 was constructed. The total length of the facility on the territory of Samokov Municipality is around 53 000 m.

On the territory of Samokov Municipality, raw water is supplied from the Rila water main for ViK EOOD – Sofia for the following settlements: Borovets, Govedartsi, Madzhare, Mala Tsarkva, Samokov, Relyovo, Rayovo, Belchin, Alino, etc.

From the village of Plana to water chamber Simeonovo the Rila water main has a tunnel profile 120/180 cm, with a total length of around 20 000m, as in the pressure sections a second water pipe, Ø900, is in place.

A high-pressure steel water pipe was constructed from the water chamber Simeonovo, in 1926, which supplies water to reservoir Lozenets (the water main is operated under pressure of around 40 bar). From this high-pressure water pipe a steel pipe was constructed, Ø900, for reservoir Malo Buchino (the so-called Malo Buchino water pipe).

In parallel with the pressure water pipe Ø900, steel, a water pipe Ø300, steel, was constructed before the water chamber Simeonov, which supplies parts of Simeonovo r.q. A water pipe Ø350, steel, is in place after it, which is in parallel with the Malo Buchino water pipe, supplying water to Dragalevtsi, Kinotsentar and Boyana residential quarters.

The Rila water main supplies water to around 20% of the territory of the Municipality of Sofia:

- Adjacent villages: Plana, Zheleznitsa, Bistritsa, Kokalyane and Malo Buchino;
- The residential quarters from the so-called ‘Vitosha-collar’: Simeonovo, Dragalevtsi, Kinotsentar, Boyana, Knyazhevo and the adjacent villa areas;
- The central urban area, supplied with water from Lozenets reservoir, which is supplied from Beli Iskar and Iskar dams;
- The town of Bankya, the adjacent residential areas Verdical, Mihaylovo and the village of Ivanyane;
- Gorna Banya and Suhodol residential quarters.

Following the implementation of the project for the water supply of Kokalyane and Pancharevo residential quarters from the Rila water main, they will be supplied with water from Beli Iskar as well, with which the present supply of water from the derivation Passarel, which is only disinfected, will be eliminated.

Many problematic sections have been found along the Rila water main related to landslide processes. Under the ISPA program in 2011 and 2012 a section was rehabilitated at syphon 3, as well as the overflow shaft at the water chamber Simeonovo.

Bankya and Gorna Banya/Suhodol may be also supplied with water as an aletrantive from Iskar Dam through the PS Lozishte. It was constructed as a reserve water supply source for the town of Bankya and throughout the years it has supplied water to Gorna Banya and Suhodol. In 2011, after reconstructions made by the WSS operator, gravity water supply has been ensured for these quarters and a regime of reserve capacity was introduced for the PS Lozishte.

For the remaining territories, supplied with water from the Rila water main, there is no alternative. As far as Beli Iskar Dam is a seasonal equalizing basin with comparatively small useful volume, in winter periods, without ensured enough inflow (very dry summer and autumn), there is a risk of introducing water regime for these territories.

1.2.4 Distribution network

The construction of the water supply system of Sofia started more than 120 years ago. Due to the high location of the water sources (Iskar dam, Beli Iskar dam, Vitoshki water catchments) supplying of the waters to the capital is performed by means of gravity. The schemes of the reservoirs and the water main network use optimally the lay of the city of Sofia and the surroundings in order to decrease to the minimum the necessity from the pumping stations.

Trunk (strategic) water mains

The territory of the Municipality of Sofia is water supplied by means of 4 water main rings. Among the separate rings connections and water mains for redistribution of the water volumes in the zone are constructed. Due to the big displacement of the terrain 3 water supply zones are specified.

First water supply zone

The first water supply zone is water supplied by reservoirs Lozenetz (level of the terrain 605 m), Konyovitsa (level of terrain 611 m) and Kolezha (level of terrain 617 m)

1st water main ring and the central city part are supplied by reservoir Lozenetz. Reservoirs Konyovitsa and Kolezha supply 2nd water main ring through which the

central and Northern part of Sofia are supplied, and 3rd water main ring through which the most distant from the center residential quarters and the suburban areas in the Northern part of Municipality of Sofia are supplied.

Second water supply zone

Second water supply zone is water supplied by reservoirs Moderno Predgradie (level of terrain 643 m), Bakston (level of terrain 652 m), Dragalevtsi (level of terrain 657 m) and Iztok (level of terrain 660 m).

Third water supply zone

The third water supply zone is water supplied by reservoirs Lozishte (level of terrain 682 m), Krasno selo (level of terrain 680 m) and Pod Simeonovo (level of terrain 691 m).
Reservoir Lozishte supplies Luyilin r.q. – 4 and 5, Filipovtsi r.q., Suhodol r.q., Ovcha Kupel r.q. – 1 and 2.

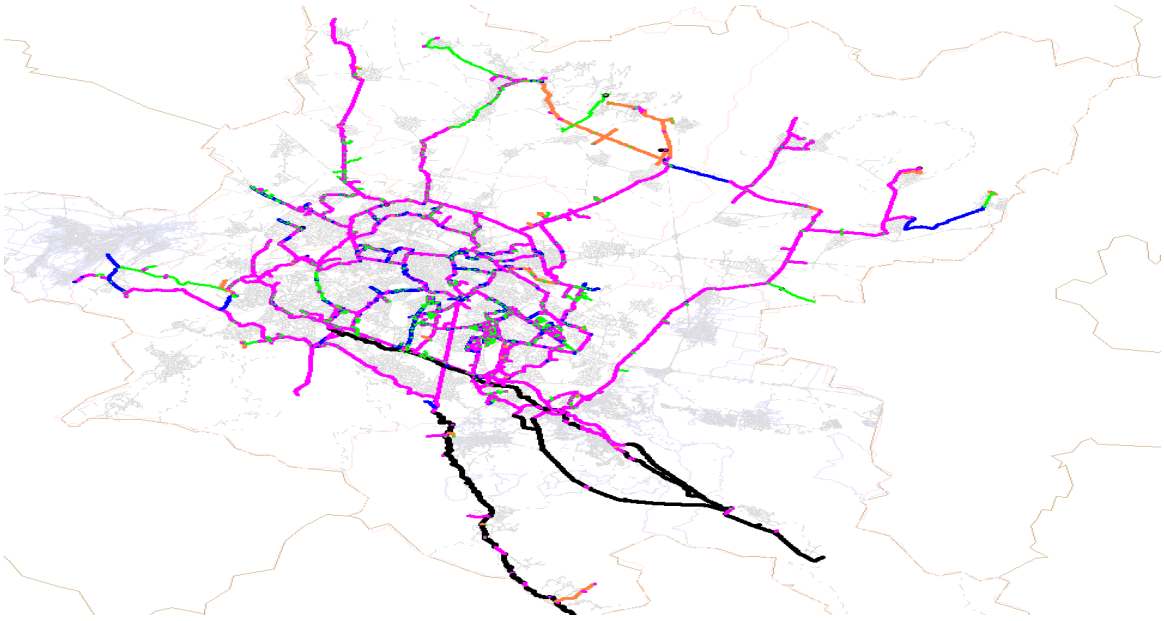


Fig. 1. Hydraulic model of the strategic water mains

Distribution water main network

The total length of the water main network for the water supply system Sofia – impounding and distribution water mains, reported in 2015 is 3,814 km.
The villages in the suburban areas included in the water supply system are specified in several water supply groups:

- The water supply group ‘Iskar gara’ includes the villages Kazhichene and Busmantsi.
- - The water supply group ‘Kremikovtsi’ – includes the villages Kremikovtsi, Seslavtsi, Botunets, Cjelopechene, Krivina, Gorni Bogrov, Dolni Bogrov, Buhovo and Yana.

- The water supply group ‘Severni sela – center’ – encompasses the villages Negovan, Svetovrachane, Chepintsi, Katina and part of Novi Iskar (Kurilo, Izgrev and Gnilyane).
- The water supply group ‘Lozen’ – includes the villages German, Lozen and Gorublyane r.q.
- The water supply group’ Bankya’ – includes Bankya, Ivanyane, Malo Buchino, Verdical, Mihaylovo and Gradoman.
- The water supply group ‘Severozapadna teritoriya’ – includes the villages Mramor, Voluyak. Dobroslavtsi, Zhiten and Katina - new.
- The water supply group ‘Novi Iskar’ – includes the villages: Trebich, Mirovyane and the town of Novi Iskar.
- The water supply group ‘Pancharevo’ – includes the villages Pancharevo and Kokalyane. The residential quarters Simeonovo, Dragalevtsi and the villages Plana, Zheleznitsa and Bistritsa are water supplied by Rila water main.
- The water supply group ‘Vladaya’ – includes the villages Vladaya and Marchaevo. The system is not supplied by the water main network of Sofia. The local water sources are in poor condition.

Water supply zones and pressure in the network

- The water supply zones are determined for a maximum static pressure 8 bar and a minimal dynamic pressure 3 bar, according to art. 24 of Ordinance 2/2005 for ‘Design, construction and operation of the water supply systems’:
- The maximum pressure in the water main network of the populated areas should be 6 bar according to § 3 of the Transitional and Final Provisions of Ordinance 2/2005: ‘The Ordinance is applied for the water supply systems whose design starts after its promulgation in State Gazette.
- It is evident from the indicated facts that there is a discrepancy between the parameters under which Sofia system is designed and implemented and the introduced new requirements in 2005. The water supply zones of Sofia are determined according to the levels of the existing strategic reservoirs and the boundaries of these zones cannot be changed.
- In a number of territories the pressure in the network exceeds the upper limit of 6 bar and on some locations it exceeds also the limit of 8 bar. The situation is especially serious for the territories of Podvitoshka yaka where the displacement at some locations is over 200 m from the point of water supply to the lowest water supplied point.
- During the last few years Sofiyska Voda has been gradually implementing a long-term project for pressure management by reducing the pressure in zones specified as priority not only for decreasing the water losses but also for achieving the set parameters in Ordinance 2/2005. In 2006 the pressure

management program will be completed in its main part and with this the zones, where pressure management is possible, will be covered. Technologically, however, it is impossible that the entire territory with pressure in the network of over 6 bar will be covered with zones for pressure management.

- Meanwhile, in the impounding and strategic water mains high pressure is maintained so that these facilities can provide the necessary water supply to the most distant points. Pressure management of these water mains may be performed only upon a careful analysis of the work regime.

In its major part, the operational condition of the distribution network is good and the main issues are the following:

- Insufficient number of stop valves working on field which allow for flexible management of the network and interruption of water supply in small zones;
- Street water mains in poor operation condition built out of poor quality materials (steel, galvanized steel, asbestos cement) which have exceeded the useful service life and/or water mains with insufficient diameter causing issues with low pressure;
- Big number of water mains built in the past at the expense of the customers without accompanying technical documentation, inaccurately sized and with high level of amortization;
- Routes of water mains passing through private properties with highly impeded access both in cases of failure and in cases of planned rehabilitation and replacement;
- Water mains with vague routes, diameter, material and year of construction, not transferred as an asset to the company despite the fact that they supply customers;
- Expansion of territories where there is no capacity of the existing network – mostly former villa zones, suburban areas as well as the surrounding villages;
- Regions with no regulation in place and with partial regulation which makes the design and construction of new water mains impossible and strongly impedes the replacement and rehabilitation of the existing ones.
- The main strategic water mains – where they have been completely built are sized for a consumption much higher that the actually monitored. The low consumption leads to a decrease in the velocity of water especially in the context of the continuously decreasing real losses which causes preconditions for the occurrence of deviations in the water quality - both in terms of disinfection of water and in terms of corroding processes and deposition of ferrous compounds.

In conclusion, the water main network on the territory of Municipality of Sofia is in unsatisfactory operational condition. During the last more than 100 years the network

has been developed and expanded simultaneously with the expansion of the city and the targeted replacement and rehabilitation of the water main network started about ten years ago. In the oldest parts of the city the so-called ideal center, still the bigger part of the network was commissioned at the start of the 20th century, and in the suburban zones big sections of the network were constructed at the expense of the customers, pass through private properties, do not meet the technical requirements and their replacement is impeded or impossible due to presence of regulation issues.

1.2.5 Facilities along the network – pumping stations, reservoirs, other

The Sofia water system is designed and functions as a gravity one. Local pumping stations (PS) are operating in separate sections of the system, mainly in the northern part of the Concession Area, which is flat.

According to the Urban Development Master Plan, the following strategic PSs are provided for:

- **PS Bakston** – reserve capacity, it is put into operation when the PWTP Bistritsa is out of operation and the water volumes from the PWTP Pancharevo are supplied through the Second pressure water pipeline. It has been fully reconstructed by the WSS operator.
- **PS Konyovitsa**– not in operation. In the strategic scheme it is set to supply water volumes from Konyovitsa reservoir to Moderno Predgradie reservoir. Its construction can be planned only after the further construction of the water main Ø900 from Ovcha Kupel 2 r.q. (from water pipeline Ø1 500);
- **PS Pod Simeonovo**– not in operation. In the strategic scheme it is set to supply water volumes from the First pressure water pipeline to the Second pressure water pipeline. Its construction can be planned only after the commissioning of reservoir Pod Simeonovo and restoring the ingoing and outgoing water pipelines.

The following pumping stations are operated on the territory of the MoS:

Pumping Station	Pumping Groups	Supplied areas	Status
PS Dobroslavtsi	2	Katina - new	In operation
		Dobroslavtsi	
PS Lokorsko	1	Lokorsko	In operation
		Voynyagovtsi	
PS Podgumer	1	Podgumer	In operation
PS Kremikovtsi	2	Kremikovtsi	In operation
		Seslavtsi	
PS Buhovo-Yana	1	Buhovo	In operation
PS Zhelyava	1	Zhelyava	In operation
PS Novi Iskar	1	Kurilo	In operation
		PS Katina	

PS Katina	1	Katina	In operation
PS Lozen 1st stage	2	Lozen	In operation
PS Lozen 2nd stage	1		
PS Plana	1	Plana	In operation
PS Lozishte	2	Bankya	Reserve
		Gorna Banya, Suhodol	
PS Bakston	1	Reservoir Moderno Predgradie	Reserve
		Reservoir Lozishte	

Table No.1: Pumping stations – existing

The pumping stations are reconstructed (replaced with effective pumping units, WSS networks, electric power installations, repair of buildings).

Pumping-hydrophore devices

300 pumping-hydrophore devices are also functioning on the territory of the MoS, which supply with water the high floors of residential buildings. Some of these devices are in individual buildings and the remaining – in the premises of the very residential buildings.

With the Decision No.137/17.03.2011 of the Sofia Municipal Council all individual buildings, planned to have a hydrophore, were excluded from the capital of the municipal company ViK EAD – Sofia and are registered as public municipal property, respectively transferred for maintenance to the concessionaire as part of the public water supply network. The condition of big part of the buildings is bad and the Company fulfills measures for stage by stage improvement of their condition in order to guarantee trouble-free operation of the pumping systems.

Reservoirs

In terms of levelling, the capital is between horizontal 520.00 and horizontal 800.00. Due to the big displacement and depending on the heights of the impounding water mains, a few water supply zones have been established in the city. The zones are formed in line with the way of the supply from the constructed reservoirs – each water supply zone is supplied from one or a few reservoirs.

Existing reservoirs

15 strategic reservoirs are constructed for the water supply to the city with a total volume of 336 560 m³. 4 reservoirs of them are with a volume of 78 060 m³ and are not in operation:

Water supply zone	Reservoir (name)	Volume (m^3)	Year	Level terrain (м)	Status
First water supply zone	Kolezha	60 000	1978	617	In operation
	Lozenets	17 000	1926	605	In operation

	Konyovitsa	26 500	1964	611	In operation
Second water supply zone	Iztok	28 500	1963	660	In operation
	Dragalevtsi	15 750	1964	657	In operation
	Moderno Predgradie	57 000	1976	643	In operation
	Bakston	21 000	1964	652	In operation
Third water supply zone	Lozishte	16 000	1977	682	In operation
	Pod Simeonovo	38 000	1976	691	Out of operation
	Krasno Selo	21 000	1976	680	Out of operation
Fourth water supply zone	Pod Boyana	16 000	1976	710	Out of operation
Fifth water supply zone	Boyana	2 500	1929	771	In operation
	Knyazhevo	3 060	1983	761	Out of operation
Town of Bankya	Malo Buchino	13 000	1979	887	In operation
	Malo Buchino - old	1 250	1950	730	In operation
Total volume		336 560			
Incl. in operation	258 500				
Incl. not in operation	78 060				

Table No.2: Strategic reservoirs – existing

44 reservoirs with a total volume of around 21 000 m^3 were constructed and are in operation for residential quarters and settlements out of the territory of the compact city:

Name	Volume [m^3]	Year	Name	Volume [m^3]	Year
Reservoir Gorna Banya	150	1966	Reservoir Klisura /Bankya/	100	1963
Reservoir Suhodol	160	1959	Reservoir Bankya - Banski rid	250	1945
Reservoir Vladaya	1 200	1991	Reservoir Mihaylovo	10	1939
Reservoir Marchaevo	100	1956	Reservoir Gradoman		
Reservoir Zhelyava	140	1989	Reservoir Lozen-mayor's office -	140	
Reservoir Yana-new	400	1965	Reservoir Lozen-tunnel	1 250	1984
Reservoir Seslavtsi	500	1993	Reservoir Dolni Passarel	100	

Reservoir Buhovo - new	1 500		Reservoir Lovdzhijska cheshma	150	
Reservoir Kremikovtsi for the monastery	200	1981	Reservoir Shumako	100	1961
Reservoir Kremikovtsi- service	1 000		Reservoir Kokalyane new	1 200	1966
Reservoir Kremikovtsi	600	1967	Reservoir Plana-new	400	1972
Reservoir Lokorsko	220	1967	Pressure reducing shaft Momina skala		
Reservoir Chepintsi	300	1967	Reservoir Imaretski	100	1963
Reservoir	220	1985	Reservoir New		
Reservoir Podgumer-old	220	1967	Reservoir for supply of Sekvoya St – government's	400	1961
Reservoir Negovan - Svetovrachane	600	1968	Reservoir Konyarnika Vitosha Park	50	
Reservoir Podgumer-new	500		Reservoir Kameno Zdanie	100	1964
Reservoir Izgrev/Gnilyane/	2 000	1970	Reservoir of PWTP Bistritsa	5 000	
Reservoir Katina - new	350	2000	Water chamber Passarel		
Reservoir Laska/ Kurilo	50	1935	Reservoir	100	1968
Reservoir Balsha	300	1971	Reservoir Elitsa - Vitosha park		
Reservoir Dobroslavtsi	800	1984	Reservoir Beli Brezi- Vitosha park		
TOTAL VOLUME:				**20 960**	

Table No.3: Minor reservoirs – existing

Chlorination Stations

The secondary disinfection of the water supplied to the system is done through chlorine and chlorinated compounds. 33 chlorination stations were constructed on the territory of the MoS, as most of them are located at main and minor reservoirs, and the remaining ones are individual points on the network.

Chlorination Station name	Chlorination	Chlorination Station name	Chlorination
Chl. Station HPP	Chlorine gas	Chl. reservoir	bleach

Passarel		Voynagovtsi	
Chl. Station Bistritsa	Chlorine gas	chl. PS Podgumer	bleach
Chl. Station Passarel	Chlorine gas	Chl. reservoir Balsha from PS	bleach
Chl. Station Simeonovo	Chlorine gas	Chl. reservoir Zheleznitsa	bleach
Chl. station Mramor	Chlorine gas	Chl. reservoir Lokorsko-Pogreba	bleach
Chl. reservoir Kolezha	Chlorine gas	Chl. reservoir Vladaya	bleach
Chl. reservoir Boyana	Chlorine gas	Chl. reservoir Zhelyava	bleach
Chl. reservoir Bakston	Chlorine gas	Chl. reservoir Katina - new	bleach
Chl. reservoir Lozenets	Chlorine gas	Chl. reservoir Klisura	bleach
Chl. reservoir Dragalevtsi	Chlorine gas	Chl. reservoir Kameno Zdanie	bleach
Chl. reservoir Malo Buchino	Chlorine gas	Chl. reservoir Yana-new	bleach
Chl. reservoir Iztok	Chlorine gas	Chl. reservoir Yana-old	bleach
chl. PS Plana	Chlorine gas	Chl. reservoir Lokorsko-local	bleach
Chl. reservoir Moderno predgradie	Chlorine gas	chl. point reservoir Imaretski	bleach
Chl. reservoir Lozishte	Chlorine gas	chl. point reservoir Gorna Banya	Chlorine gas
Chl. reservoir Marchaevo	bleach	chl. point reservoir Lozen – mayor's office	bleach
chl. point Konyovitsa	bleach, produced from sodium chloride	-	-

Table No.4: Chlorination stations

There is permanent monitoring of the quality of the water supplied in the network and the parameters of the primary and secondary disinfection.

1.2.6 The expected construction and provision for management of public assets over the business plan period (except the WSS operator investment program)

Outside the SV AD investment program public assets **in the part of the water supply systems** are constructed by MoS and private investors. These are exclusively and only **water mains**. The company does not have information on the investment intentions for the period 2017-2021 of the mentioned potential investors.

It should be taken into consideration that at least in the first three years of the regulatory period the commissioning of new public WSS assets with the funding under EU programs may not be expected. Most likely public WSS assets will be provided for operation by the company at the end of the period and will not have a material effect over the operation expenses and over the KPIs.

The effect of water mains possibly built and transferred for operation by private investors would be insignificant. For the period 2012-2015 the company has accepted on an average of 5.5 km of water mains per year, constructed by private investors. This value, however, may not be used as a projection for the next 5 years. In the last years the SV AD team focused efforts on finding and gathering the necessary documentation of the acceptance of the constructed by private investors WSS assets in preceding years, i.e. the mentioned number contains accumulated results from previous years and it may not be taken into account that there will be similar values in the future. On the other hand, in the process of optimizing the water supply network, a number of places are excluded. SV considers that the new water supply network transferred will be recompensed for the excluded parts.

Sofiyska Voda sent an official inquiry to the MoS in connection with the projects planned by them for the period 2017-2021. The official response, which the company received, is that at that moment the municipality is preparing the list with the regional feasibility studies, due to which it cannot submit information in connection with the inquiry that was made.

1.3. DESCRIPTION OF THE WSS SYSTEMS – SEWERAGE

1.3.1 Sewer network

The sewer network of the city of Sofia was constructed as a combined system with five-fold dilution of the wastewater.

Its construction started in 1897 under the design of the Vienna specialist Rella. Right Vladayski collector, from Stochna Gara to Hr. Botev Blvd. and Left Perlovski collector, from Stochna Gara to Graf Ignatiev St were constructed.

To date, the length of the main sewer collectors on the territory of the city of Sofia is more than 430,000 m. There are 11 main sewer collectors. Their routes are parallel to the banks of the rivers crossing Sofia and ensure gravity drainage of the wastewater from the compact city and out-of-urban areas to the WWTP Kubratovo.

These are the main collectors: Kakachki Desen, Suhodolski – Left and Right, Vladayski – Left and Right, Perlovski – Left and Right, Slatinski – Left and Right, Vodyasht 1 and Vodyasht 2.

The length of the serviced sewer network in the base year (2015) was 1677 km.

1.3.2 Main sewer collectors

Right Kakachki collector

Main collector

It is constructed from the discharge in Vodyasht 1 /Benkovski r.q./ to the Kakach River and Ring-road Blvd. /Republika r.q./. It drains the wastewater from the northernmost part of the city. Its total length is around 11 700 m, with the following sizes: P-400/250 cm, П-325/225, Ø2000, Ø1600, П-150/165 cm, П-125/165 cm. It was constructed in the period 1980-1986 г.

According to the Urban Development Master Plan, Right Kakachki collector has a catchment area of 4532.91 ha, number of inhabitants – 174,986 residents.

The Right Kakachki collector is a relatively new collector. The parameters, with which it was dimensioned, are in line with standards from 1973 and are close to the effective legislation. There are constructed relief sewers.

The Right Kakachki collector was constructed shallow, therefore the non-constructed overflow channels are bound in levelling terms with the design levels of the future correction of the Kakach River. Update of the designs is needed. The lack of constructed overflow channels disrupts at the time of rainfall the functioning of the sewerage network and the city wastewater treatment plant.

The Right Kakachki collector has no relief sewers; the role of a relief sewer is performed by the collector P-240/180 cm, P-200/155 cm, crossing the northern part of Voenna Rampa area (Orlandovtsi r.q.).

Sub-collectors:

The following sub-collectors discharge in Kakach collector:

- Collector for the town of Bankya: a newly constructed collector under the ISPA program drains the town of Bankya and the adjacent territories (village of Ivanyane, Izgrev r.q., Bankya villa area, Verdikal r.q., Mihaylovo r.q.) – its construction allows the construction of sewers on these territories. The collector is long around 7 900 m with a route from the town of Bankya to the discharge point in Kakach collector in the area of Vrabnitsa, with diameters Ø1000, Ø800, Ø600, Ø500;
- Collector A: P-250/230 cm, P-185/185 cm, it drains residential areas 1, 2, 3, 4 and part of 5 of Lyulin r.q.;
- Collector H: P-200/185 cm, P-175/185 cm, P-125/185 cm, P-125/165 cm, it drains areas 8 and 9 of Lyulin r.q., part of Slivnitsa area, parts of Moderno Predgradie r.q.;
- Relief sewer of collector H: existing section P-200/185, it drains areas from Vrabnitsa 1 r.q., a newly constructed section in the period 2009-2013, Ø1500, Ø1200, it drains Moderno Predgradie r.q. and areas from Slivnitsa area – its construction allows the construction of sewers on these territories;
- Collector P-250/185, it drains Obelya and Obelya 2 r.q.;

- Collectors Ø600 and Ø800, they drain Obelya 1 r.q.;
- Collectors P-200/185 cm, P-175/185 cm, P-120/180 cm and P-150/205 cm, they drain Vrabnitsa, Nadezhda and Svoboda r.q.;
- Sewer 60 cm in Rozhen Blvd. is a temporary solution for the drainage of Iliyantsi r.q.;
- Collector Ø800/600, a newly constructed collector in 2011, it drains Benkovski R.Q., its construction allows the construction of sewers on this territory.

LEFT SUHODOLSKI COLLECTOR (LSC)

Main collector

It is constructed from the discharge in the Right Kakachki collector /Voenna Rampa area/ to Suhodol r.q. Most of its route is parallel to Suhodolska River. Its total length is around 12 760 m, with P-400/250 cm, P-250/165 cm, Ø250/185 cm, Ø2100, P-200/165 cm, P-180/210 cm, P-125/185 cm, Ø1200, Ø1000, Ø800, oval profile 60/90 m.

Due to the bad operational condition of the existing ground correction of Suhodolska River, the construction of two overflow channels has not been completed. This has an adverse effect on the functioning of the WWTP during rainfalls.

The LSC drains areas of Voenna Rampa and Orion, areas of Nadezhda 1 r.q., areas of Moderno Predgradie r.q., areas of Lyulin – Slivnitsa-Iztok and Lyulin-Center, Lyulin r.q., areas 10, 6, 7 and part of 5, as well as Suhodol r.q. Due to the failure to fully construct the Right Suhodolski collector, the wastewater from Nadezhda-Triagalnika r.q. is discharged in the LSC.

According to the Urban Development Master Plan, the LSC has a catchment area of 1003.84 ha and number of residents – 100,024. The LSC is a relatively new collector. The parameters with which it was dimensioned are in line with the standards from 1973 and are close to the effective legislation. There are no constructed relief sewers.

Overflow channels and corrections of rivers:

According to the Urban Development Master Plan 6 overflow shafts were constructed. Due to the bad condition of the existing ground correction of Suhodolska River in the area of Voenna Rampa, the construction of the overflow channel has not been completed from overflow shaft 6, also the overflow channel P-250/165 cm is not in operation, from the shaft 4 before the bridge along the axis on railway Sofia – Dragoman.

Sub-collectors:

- Collectors with oval profiles 90/130 cm and 60/90 cm for Voenna Rampa;
- Collectors with oval profiles 60/90 cm and 70/105 cm for Nadezhda 1 r.q.;
- Collector with oval profile 90/130 cm for Moderno Predgradie r.q.;

- Collector Ø1600, Ø1400, Ø1200 for Lyulin 10;
- Collector П-175/185 cm for Lyulin 7;
- Collector with oval profile 110/165 cm for Lyulin 6 and 5.

RIGHT SUHODOLSKI COLLETCOR (RSC)

Main collector:

The Right Suhodolski collector is partially constructed in the section from Nadezhda-Triagalnika r.q. and it is discharged in the Left Suhodolski collector. The collector is around 800 m long, with diameters Ø800 – Ø600 – Ø1600 – Ø1000. To date it drains only Nadezhda-Triagalnika r.q.

According to the Urban Development Master Plan, the RSC has a catchment area of 447.92 ha and number of residents – 16,692. It is planned to receive waters from the industrial area Nadezhda, Triagalnika-Zadgarov zone, Bratska Mogila and Orlandovtsi – Malashevtsi.

Sub-collectors:

Existing sub-collectors:

- Collectors Ø1000, reinforced plastic; Ø900, reinforced plastic and Ø600, concrete for Nadezhda-Triagalnika r.q.;
- Sub-collector P-200/175 for Orlandovtsi r.q. Due to the failure to complete the construction of the RSC this collector discharges directly in Suhodolska River.

GAROV COLLECTOR

Main collector:

It discharges in Left Valadayski collector at their common discharge in the relief sewer of Right Vladayski collector. It is constructed up to Zaharna Fabrika r.q. It crosses the territory of the Central railway station, and in some sections parallel to the railways. It was constructed with the diameters from the discharge in the LSC: oval profile 60/90 cm – oval profile 140/210 cm – tunnel 210/210 cm – oval profile 90/130 cm – oval profile 120/180 cm – oval profile 140/210 cm – oval profile 90/130 cm – oval profile 60/90 cm – tunnel 210/210 cm – Ø1900. Its total length is around 4 300 m.

It transfers waters to the relief sewers of Garov collector through a connection – oval profile 120/180 cm at Opalchenska and Maria Louiza streets (the beginning of the relief sewer). According to the Urban Development Master Plan, the number of the relief channels from the Garov collector to the relief sewer is insufficient.

Relief sewer:

The route of the relief sewer from Garov collector is to the south of it. It ensures the gravity drainage of the pedestrian underpasses in Knyaginya Maria Louiza Blvd. and

the square in front of the railway station. It discharges in Left Vladayski collector in the area of Stochna Gara; it is constructed up to the Opalchenska St, with diameters of the discharge in the LSC P-150/120 cm – oval profile 110/165 cm – tunnel 250/230 cm – 240/200 cm.

Sub-collectors for Garov collector:

- Collector with oval profile 50/75 cm for Zaharna Fabrika r.q.;
- Collector with oval profile 60/90 cm for Fondovi Zhilishta r.q.;
- Collector with oval profile 100/150 cm for Banishora r.q. (Central prison).

Sub-collectors for the relief sewer of Garov collector:

- Collector Ø1000 in Knyaginya Maria Louiza Blvd.;
- Collectors Ø800 – oval profile 70/105 cm and oval profile 70/105 cm – oval profile 60/90 cm for Banishora R.Q. – west area (at Opalchenska St).

LEFT VLADAYSKI COLLECTOR (LVC)

Main collector:

The LVC is constructed in the sections:

- From the discharge in the relief sewer of Right Vladayski collector in the area of Stochna Gara up to Eng. Ivan Ivanov Blvd., along the north roadway in Slivnitsa Blvd., parallel to Vladayska River; oval profile 60/90 cm – oval profile 80/120 cm – oval profile 70/105 cm – oval profile 60/90 cm – oval profile 80/120 cm – oval profile 70/105 cm – oval profile 60/90 cm – oval profile 80/120 cm, around 2 650 m long; in this strategy it is called **LVC – stage 1**;
- From Eng. Ivan Ivanov Blvd. up to Ovcha Kupel 1 r.q.; it is constructed with diameters – oval profile 140/210 cm – P-250/165 – Ø1600 – P-195/165 – Ø1600 – П-150/120 – Ø2000 – П-250/100 cm – Ø1000 – Ø1400, around 3,460 m long; in this strategy it is called **LVC – stage 3**;
- From the discharge in LVC – stage 3 at 672 St in Ovcha Kupel r.q., in Voyvodina Mogila up to Sredselo square and up to Polk. Stoycho Bachiyski St, Karpuzitsa r.q.; diameters of Ø1200, Ø900, Ø800, Ø600, Ø500, Ø400, around 3,950 m long; in this strategy it is called **LVC – stage 4**;
- The LVC is not constructed in the section from the discharge in Right Kakachki collector to the area of Stochna Gara and along Eng. Ivan Ivanov Blvd., between Slivnitsa Blvd. and Doctor Kalinkov St; in this strategy it is called **LVC – stage 2**;

Relief sewer:

- Relief sewer LVC is constructed in Slivnitsa Blvd. (the north roadway) and Eng. Ivan Ivanov Blvd., in the section from Budapest St to Doctor Kalinkov

St.; oval profiles 140/210 cm – 150/225 cm – 140/210 cm, around 2 900 m long; in this strategy it is called **RLVC – stage 2.**

- **RLVC - stage 2** accepts the waters from LVC – stages 3 and 4, and also the waters from Right Vladayski Collector (at Doctor Kalinkov St) and it is discharged in the relief sewer of Right Vladayski Collector (crossing under Vladayska River between Budapest St and G.S.Rakovski St) up to the construction of the previous section (RLVC – stage 1). Thus, in practice all water volumes from the Left Vladayski collector and its relief sewer are discharged in the relief sewer of Right Vladayski collector, which considerably overloads it and disrupts the normal operation of the whole system.
- The relief sewer of the LVC is not constructed in the section from the discharge in Kakach collector to G.S.Rakovski St.; diameters P-250/85 cm, Ø2200, Ø2000, Ø1800, Ø1400, overflow channel 220 cm, sag pipe under the Suhodolska River, with a route from the transverse connection Ø1000 with Right Vladayski collector at Tri Ushi St, in Slivnitsa Blvd., crossing under the Vladayska River. It is discharged in Kakach collector P-400/205 cm. Its total length is around 5 040 m, as there is also an overflow channel, 142 m.

This section is performed under the OP Environment 2007-2013. It is called **RLVC – Stage 1**. Its implementation is of key importance for the normal functioning of the sewerage network.

Sub-collectors:

- Collectors: oval profile 100/150 cm, Ø1000, Ø2400 and П-400/165 cm for Ovcha Kupel 1 r.q.;
- Collectors Ø800 and Ø600 in Vazkresenie Blvd., oval profile 120/180 cm and Ø1000 in Al. Stamboliyski Blvd., for Razsadnika-Konyovitsa r.q., Zapaden Park and Krasna Polyana;
- Collectors Ø1200 in Naycho Tsanov St, P-180/130 cm, P-230/130 and Ø1000 in Pirotska St, oval profile 80/120 cm in Tsar Simeon St, Ø1600 and oval profile 140/210 cm in Slivnitsa Blvd. For Ilinden and Sveta Troitsa r.q.
- For LVC - Stage 4 (constructed under the ISPA Program):
- Collectors Ø500, П-125/165 cm – Ø1000 и Ø600 for Ovcha Kupel 1 r.q.;
- Collectors, oval profile 80/120 cm, oval profile 60/90 cm and Ø500 for Karpuzitsa r.q.

RIGHT VLADAYSKI COLLECTOR (RVC)

Main collector:

The RVC is also partially constructed as follows:

- Towards Central Railway Station up to Hristo Botev Blvd. This is the first collector in the city of Sofia, constructed in the period 1898-1911.

Constructed with an oval profile 130/195 cm – P-210/160 cm – oval profile 80/120 cm – oval profile 90/130 cm, around 1 500 m long, called in this strategy – **RVC - Stage 1**;

- At the railway the RVC-Stage 1 discharges in the relief sewer of the Right Vladayski collector. The Left Vladayski collector (Stage 1) is discharged almost in the same section of the relief sewer of the RVC, after the discharge of Garov collector and its relief sewer.
- The RVC has been constructed in the section from Serdikla r.q. (Doctor Kalinkov St) to Knyazhevo r.q. (Belotok St). The RVC is with diameters in oval profile 130/195 cm – oval profile 120/180 cm – oval profile 110/165 cm – oval profile 100/150 cm – oval profile 80/120 cm – Ø1000 – Ø800, a total length of around 6 060 m. It is called in this strategy – **RVC-Stage 2**;

At Dr. Kalinkov St the waters from the RVC are discharged in the Left Vladayski collector/ relief sewer of the Left Vladayski collector.

- A collector was constructed to the RVC under the ISPA Program in Todor Kableshkov Blvd. And Ovcha Kupel, from Bratya Bakston Blvd. Up to the RVC, diameters Ø2000, Ø1400, Ø1200, Ø1000, 1 010 m long. This collector will allow the construction of sewerage in Bakston and Manastirski Livadi – Zapad r.q.

RELIEF SEWER:

- A relief sewer of the RVC has been constructed from the discharge point in collector Vodyasht 1 (Malashevtsi r.q.) to the central area (the crossing of Todor Aleksandrov Blvd. and Eng. Ivan Ivanov Blvd.). Its diameters are P-200/205 cm – P-220/225 cm – oval profile 140/210 cm – tunnel 260/260 cm – tunnel 360/360 cm – tunnel 300/300 cm – tunnel 180/180 cm – tunnel 210/210 cm, around 5 500 m long;

  The relief sewer of the RVC accepts the waters from the Right Vladayski collector (Stage 1 - Center), as well as the Left Vladayski collector (Stage 1 – Center) and Garov collector and its relief sewer, in the section at the railway for the Central Railway Station.

  The relief sewer of the RVC accepts the waters from the relief sewer of the LVC (connection under the Vladayska River between Budapest St and G.S.Rakovski St), through which it accepts the waters from the LVC – stages 3 and 4 (LVC from Eng. Ivan Ivanov Blvd. Up to Karpuzitsa r.q.), as well as from the RVC–Stage 2 (from Dr. Kalinkov St to Knyazhevo r.q.).
- To the relief sewer of the RVC also collector P-250/230 cm is accepted, constructed from the discharge point in collector Vodyasht 1 (Malashevski Grobishta Park) in Dan Kolov St (the so-called sewer along Sgurootvala), 890 m long and an overflow channel 150 cm. It is called in this strategy relief sewer of the RVC – Stage 2.

It can be seen that the relief sewer of the RVC is overloaded. The construction of the first stage of the relief sewer of the LVC (from the discharge point in Kakach collector up to the Center R.Q.) will considerably relieve its operation.

Sub-collectors:

- Collector Ø1000 in Nikola Voynovski St, for part of Hadzhi Dimitar r.q.;
- Collector Ø1000 through Hadzhi Dimitar area, accepting the waters from two collectors with an oval profile 90/130 cm in Angista St and Gen. Danail Nikolaev Blvd. For the central urban area;
- Collector with an oval profile 80/120 cm in G.S.Rakovski St for the central urban area;
- Collector tunnel 210/210 cm in Veslets St for the central urban area;
- Collector with an oval profile 60/90 cm in Knyaginya Maria Louiza Blvd. for the for the central urban area;
- Collectors tunnel 210/210 cm and an oval profile 80/120 cm in Stefan Stambolov St for the central urban area;
- Collectors with an oval profiles 140/210 cm and 80/120 cm in Hristo Botev Blvd. for the central urban area;
- Collector with an oval profile 80/120 cm from Kamen Andreev St for Serdika r.q.;
- Collector Ø800 in Akad. Geshov Blvd. for Serdika r.q.;
- Collector Ø1200 (discharges at Kostenets St) for Sredets area;
- Collector Ø600 for Slavia r.q.;
- Collector with an oval profile 70/105 cm in Ovcha Kupel Blvd. for Bakston r.q.;
- Collector with an oval profile 70/105 cm in Gusla St for Bakston r.q.;
- Collector Ø1200 in Naroden Geroy St for Bakston R.Q. and the adjacent area from Ovcha Kupel 1 r.q.
- Collector P-200/165 cm for Gardova Glava r.q.

LYAV PERLOVSKI COLLECTOR (LPC)

Main collector:

The LPC passes along the west roadway in Evlogi and Hristo Georgievi Blvd. in the section from Madrid Blvd. (where it crosses the Perlovska River and discharges in the relief sewer of the Right Perlovski collector) up to Frityof Nansen St. It is constructed with an oval profile 80/120 cm and an oval profile 60/90 cm, the total length of the overflow channels is around 3 170 m. 7 overflow channels have been constructed, discharging in the Perlovska River. The collector was constructed at the beginning of the 20th century. It drains the adjacent central urban area.

Sub-collectors:

- Collector with an oval profile 80/120 cm in Yanko Sakazov Blvd.;

- Collector with an oval profile 60/90 cm in Shipka St;
- Collector with an oval profile 80/120 cm in Tsar Osvoboditel Blvd.;
- Collector P-350/160 cm in Gurko St;
- Collector with an oval profile 80/120 cm in Graf Ignatiev St.

RELIEF SEWER:

The relief sewer of the LPC was constructed in the 80's from its discharge point in the collector Vodyasht 2 (to the north of Vasil Levski G R.Q.) to Kriva Reka r.q. It was constructed with diameters P-350/185 cm, P-400/250 cm, P-400/165 cm, P-300/160 cm, P-240/240 cm, P-210/210 cm, P-200/185 cm, P-150/185 cm, an oval profile 90/130 cm. Its total length with the overflow channels is around 8 990 m. Two overflow channels have been constructed before its discharge in the collector Vodyasht 2.

From the Right Perlovski collector waters are transferred to the relief sewer of the LPC:

- At Tsar Osvoboditel Blvd. through a collector with an oval profile 70/105 cm;
- At Graf Ignatiev St through a tunnel 180/180 cm.
- The Right Perlovski collector discharges in the relief sewer of the RPC at Malashevtsi r.q. The Left Slatinski collector discharges in the relief sewer of the LPC in Suhata Reka r.q. (near the Gerena Stadium).
- Sub-collectors:
- Collector Ø800 for part of Hadzhi Dimitar r.q.;
- Tunnel 210/210 cm at Tsar Osvoboditel Blvd.;
- Tunnel 210/210 cm in Prof. Nikolay Mihaylov St;
- Tunnel 210/210 cm in G.S.Rakovski St;
- Collectors Ø600, Ø1 000, P-180/210 cm, an oval profile 70/105 cm at the National Palace of Culture;
- Collector with an oval profile 60/90 cm in Zdrave St;
- Collector with an oval profile 90/130 cm in Pencho Slaveykov Blvd. for Kriva Reka r.q.

RIGHT PERLOVSKI COLLECTOR (RPC)

Main collector:

The RPC has been constructed from the discharge point in the relief sewer of the LPC at Malashevtsi r.q. up to Belite Brezi r.q. It is constructed with diameters P-300/185 cm, oval profile 150/225 cm, oval profile 80/120 cm, oval profile 70/105 cm, P-210/210 cm, P-200/185 cm, P-150/205 cm, P-150/165 cm, P-250/205 cm. The total length with the overflow channels is around 7,640 m.

RELIEF SEWER:

A relief sewer has been constructed of the RPC in the section from Georgi Asparuhov stadium reaching the area of Orlov Most (Viktor Yugo St). This relief sewer discharges in the Right Perlovski collector, it is constructed with diameters P-

200/165 cm, oval profile 140/210 cm, oval profile 120/180 cm, tunnel 210/210 cm. Its length is around 2 600 m;

A second relief sewer of the RPC P-125/120 cm with an overflow channel has been also constructed in Petko Karavelov Bllvd., in the section from Bulgaria Blvd. to Zabarde St. In practice, this collector had not been used until it was fully constructed under the ISPA Program through residential quarters Ivan Vazov, Strelbishte, Gotse Delchev and Motopista up to the crossing of Todor Kableshkov Blvd. and Bulgaria Blvd. – a collector with diameters Ø2400 - Ø1000, around 2,915 m long. This project allows the construction stage by stage of the sewer system in Manastirski Livadi-Iztok R.Q., areas from Manastirski Livadi-Zapad and Krastova Vada, as well as territories to the south of the ring road – areas from Boyana and Kinotsentar.

LEFT SLATINSKI COLLECTOR (LSC)

Main collector:

LSC has been constructed from its discharge point in the relief sewer of the Left Perlovski collector in Suhata Reka R.Q. (near Gerena stadium) up to Hladilnika R.Q. (Cherni Vrah Blvd.). It is constructed with diameters P-180/200 cm, oval profile 120/180 cm, oval profile 70/105 cm. Its total length together with the overflow channels is around 10,000 m. Its route crosses residential quarters Suhata Reka, Hristo Smirnenski, Geo Milev, Iztok, Izgrev, Borisova Gradina Park and Hladilnika.

The LSC drains areas from residential quarters Hladilnika, Lozenets, Borisova Gradina, Iztok, Izgrev, Geo MIlev, Hristo Smirnenski and Suhata Reka. According to the Urban Development Master Plan the water catchment area is 890 ha and 80,375 inhabitants.

Sub-collectors:

- Collectors with an oval profiles 70/105 cm and 80/120 cm for Suhata Reka r.q.;
- Collectors Ø600, oval profile 70/105 cm, P-150/165 cm, oval profile 100/150 cm и oval profile 80/120 cm for residential quarters Hristo Smirnenski and Geo Milev;
- Collectors with an oval profiles 70/105 cm, 50/75 cm, 60/90 cm for Iztok r.q.;
- Collector with an oval profile 120/180 cm for residential quarter Lozenets and Borisova Gradina;
- Collector with an oval profile 60/90 cm for residential quarter Hladilnika.

RELIEF SEWER:

In 2010-2011 the WSS operator started the construction of the relief sewer of the LSC in Hristo Smirnenski r.q. RLSC was constructed from the discharge point in the Right Slatinski collector up to Shipchenski Prohod Blvd. together with an overflow

channel – collector Ø1200, Ø1400 reinforced plastic. This relief sewer of the LSC is planned to drain the residential quarters Geo Milev, Iztok, Izgrev and areas from Lozenets.

RIGHT SLATINSKI COLLECTOR (RSC)

Main collector:

The RSC has been constructed from its discharge point in the collector Vodyasht 1 (Malashevski Grobishta Park) up to Hladilnika r.q. It is constructed with diameters P-150/185 cm, P-250/120 cm, P-200/155 cm, P-250/185, P-220/225 cm, oval profile 140/210 cm, P-300/225, oval profile 120/180 cm, oval profile 90/130 cm, P-150/185 cm. Its total length together with the overflow sewers is around 12,500 m.

Under the ISPA Program the section was completed from the RSC in Hladilnika r.q. (Srebarna St, Cherni Vrah Blvd., Todor Kableshkov St), collector Ø1200, Ø800, Ø600, 950 m long, which will allow the construction stage by stage of the sewers in residential quarters Krastova Vada and Dragalevtsi.

The RSC crosses the residential quarters Malashevski Grobishta, Malashevtsi, Vassil Levski, Hristo Botev, Hristo Smirnenski, Poligona, Iztok, Dianabad, Vitosha-HPP Simeonovo and Hladilnika. It drains the residential quarters Vassil Levski, Hristo Botev, Slatina, the relevant area from Hristo Smirnenski, Poligona, a close area from Iztok r.q., Musagenitsa, Mladost 1, Dianabad, Darvenitsa, Studentski Grad. After the completion of its construction under the ISPA Program it is planned to accept the wastewater from the future network in residential quarters Krastova Vada, Vitosha-HPP Simeonovo, Malinova Dolina, as well as Dragalevtsi, Simeonovo and the adjacent villa areas (Kinotsentar, Simeonovo-Dragalevtsi, Simeonovo-Sever).

According to the Urban Development Master Plan the drained area is 3593.92 ha, with population of 158,560 residents.

RELIEF SEWER:

According to the Urban Development Master Plan, the RSC is duplicated in two sections:

- Collector P-250/120 cm in Malashevtsi r.q. (from the sag pipe up to Besarabia St);
- Collector with an oval profile 90/130 cm in Geo Milev r.q. (from the ring-road railway up to Tsarigradsko Shosse Blvd.).
- Sub-collectors:
- Collector P-240/150 cm in Besarabia St for Vassil Levski r.q.;
- Collector with an oval profile 120/180 cm for Hristo Botev r.q.;
- Collector P-250/230 for Slatina area and areas from Druzhba 1;
- Collector P-300/205 cm for Poligona r.q.;

- Collector Ø1200, accepting a few collectors from the north and south roadway of Rsarigradsko Shosse Blvd. for residential quarters Poligona and Mladost 1;
- Collector with an oval profile 70/105 cm in G.M.Dimitrov Blvd. – for residential quarters Musagenitsa, Darvenitsa, Studentski Grad and Malinova Dolina;
- Collector with oval profiles 90/135 cm, 80/120 cm in Dragan Tsankov Blvd. for residential quarters Dianabad, Darvenitsa, Studentski Grad and Malinova Dolina;
- Collector with an oval profile 70/105 cm in Nikola Gabrovski St for residential quarters Dianabad and Studentski Grad;
- Collector Ø500 in Simeonovsko Shosse Blvd. for residential quarters Studentski Grad, Malinova Dolina, Vitosha HPP-Simeonovo, Simeonovo;
- Collector Ø1000 (partially constructed) for residential quarter Vitosha HPP-Simeonovo.

COLLECTOR VODYASHT 1

Collector Vodyasht 1 drains the wastewater from the north-west area of the city of Sofia to the WWTP Kubratovo. The collectors Kakach (including Suhodolski collector and the relief sewer of the Left Vladayski collector), the Right Vladayski collector and the relief sewer of the Right Vladayski collector, as well as the transfer from the Right Slatinski collector to the Malashevski Grobishta Park, are connected to it. The collector Vodyash 2 is connected to the last section of the collector Vodyasht 1, before the WWTP Kubratovo.

The collector crosses the residential quarters Hadzhi Dimitar and Malashevtsi, to the east of the residential quarters Orlandovtsi and Benkovski, up to the connection with the WWTP Kubratovo.

According to the Urban Development Master Plan, its catchment area is 858.41 ha with 20,553 residents. The section from the WWTP to the last receiving shaft has been dimensioned for twofold diluted household and industrial wastewater – 11,000 l/s. The section from the receiving shaft to the sag pipe along the so-called Gradska River (after the union of the rivers Vladayska and Suhodolska) has been dimensioned for three-fold diluted household and industrial wastewater – 15,900 l/s.

The collector Vodyasht 1is with diameters and profiles: P-510/215 cm (open), P-270/225 cm (open), P-250/230 см, P-240/200 cm, P-270/200 cm, P-280/210 cm, and the total length with the overflow channels is 6,400 m.

COLLECTOR VODYASHT 2

Main collector

The collector Vodyasht 2 has been constructed from its discharge point in the collector Vodyasht 1 before the WWTP Kubratovo to the residential quarter 2. It is

constructed with diameters P-400/250 cm, P-350/225 cm, P-250/185 cm, P-210/210 cm, P-250/205 cm, oval profile 120/180 cm, P-200/165 and other. The total length together with the overflow channels is around 15,860 m.

The collector Vodyasht 2 crosses to the east of the residential quarters Benkovski and Orlandovtsi, in the far eastern areas of Vassil Levski – G R.Q., Vassil Levski, Hristo Botev, Gara Iskar area, residential quarters Druzhba 1 and 2. It drains the southeastern areas of the city of Sofia – Vassil Levski – G, Vassil Levski, areas from Hristo Botev, Gara Iskar area, Druzhba 1 and 2, 7th kilometer, Gorublyane, Mladost 1A, 2, 3 and 4, villa area American College.

At Malashevski Grobishta Park the waters from Slatinski and Perlovski collectors are distributed to the collectors Vodyasht 1 and Vodyasht 2.

According to the Urban Development Master Plan, the catchment area of the collector Vodyasht 2 is 5163.55 ha with 174,477 residents.

According to the Urban Development Master Plan duplicate overflow channels should be constructed because the conductivity of the existing ones is insufficient.

Sub-collectors:

The collector Vodyasht 2 has the following sub-collectors:

- Collector Ø1400 in Vassil Levski – Г r.q.;
- Collectors Ø1000, Ø800 and Ø600 in Vassil Levski – Г r.q.;
- Collector Ø1600 in Vassil Levski r.q.;
- Collector Ø1200 at Botevgradsko Shosse Blvd. for the south areas of Vassil Levski r.q.;
- Collector Ø1200 for Airport Sofia r.q.;
- Collector P-260/165 cm at Gara Iskar area, draining Druzhba 1 r.q.;
- Collectors with oval profile 120/180 cm, oval profile 60/90 cm, Ø700, oval profile 100/150 cm, oval profile 60/90 cm and P-250/185 cm, draining Gara Iskar area and Druzhba 1;
- Collectors Ø1000 and Ø600 at Druzhba 2 r.q.;
- Collector Ø1000 from Gorublyane r.q.

COLLECTOR MLADOST-DRUZHBA

The main sub-collector of Vodyasht 2 is the collector Mladost-Druzhba, draining areas from Gorubluane, 7th kilometre, Mladost 2, 3 and 4.

The collector is constructed with diameters P-325/225 cm, P-240/200 cm, P-175/165 cm, P-125/120 cm, Ø1000, with total length of around 4 760 m. It crosses the territory of Druzhba 2 (to the north of Tsarigradsko Shosse Blvd.), then – the green areas between Gorublyane r.q. and Mladost r.q., and then through the far east area of the residential quarters Mladost 3 and 4.

Sub-collectors:

- Collector Ø1200 from Gorublyane r.q.;
- Two collectors Ø800 from the residential quarter 7th kilometre;
- Collectors in Mladost 3 r.q.: P-125/165 cm, Ø1200, oval profile 60/90 cm, Ø800;
- Collectors in the residential quarter Mladost 4: Ø1000, Ø1000, Ø1200, Ø1000, Ø1000, Ø800, Ø1000.

The newly constructed and connected network of Bankya r.q. was transferred for operation in 2016, which increases by 35 km the length of the network maintained in the Concession Area.

1.3.3. Facilities on the network – pumping stations, reservoirs, other

The existing sewer pumping stations (SPS) are in the north and east areas of the city:

- **SPS Benkovski** was constructed as part of the project for the construction of receiving bodies in Benkovski r.q.;
- **SPS Novi Iskar** was reconstructed and commissioned under the ISPA Program, through which the wastewater from the town of Novi Iskar is discharged in the WWTP Kubratovo;
- **SPS Iliyantsi** was constructed by the WSS operator as part of the project for construction of sewer network in Iliyantsi r.q.;
- **SPS Gorublyane** was constructed as part of the project for the construction of sewers in Gorublyane r.q. Through it the wastewater from main branch IV to main branch I is re-pumped due to the fact that the second receiving body for the residential quarter under the Tsarigradsko Shosse Blvd. Has not been realized. The further construction of sewers in the residential quarters without the realization of the second receiving body and without the construction of the overflow channels from main branch IV and main branch I creates risks of flooding;
- **SPS Botunetz** is not in operation and it has not been transferred for operation and maintenance to the WSS operator.

1.3.4 Expected construction and transfer for management of public assets over the business plan period (outside the WSS operator investment program)

Outside the SV AD investment program public assets in the **part of sewer systems** are built by MoS and private investors. These are sewer collectors and sewers. The company does not dispose of information regarding investment intentions for the period 2017-2020 of the mentioned potential investors.

It should be taken into consideration that in the first three years, at least, of the regulatory period the commissioning of new public assets funded under EU programs

may not be expected, i.e. in any case public WSS assets will be transferred for operation to the company at the end of the period at the earliest and will not have a material effect on the operational expenses, nor on the KPIs.

The effect of sewers, possibly built and transferred for operation by private investors will be insignificant as well. For the period 2012-2015 the company has accepted on the average of 2.5 km of sewers built by private investors per year. This value, however, may not be used as a projection value for the next 5 years. In the last years SV AD focused its efforts on finding and gathering the necessary documentation for acceptance of the WSS assets constructed by private investors in previous years, i.e. the number mentioned contains accumulated results from previous years and it may not be considered that there will be a similar value in the future.

Sofiyska Voda sent an official request to Municipality of Sofia in connection with their planned projects for the period 2017-2021. Official respond which the company received was that at the time the municipality prepares its regional feasibility study and therefore cannot provide information in relation to this inquiry.

1.4. DESCRIPTION OF THE WSS SYSTEMS – WASTEWATER TREATMENT

1.4.1. Points of discharge without treatment

While conducting the survey of the sewer network, 156 points of discharge without treatment were found. Considerable investments are needed for the establishment of receiving bodies, which to drain the wastewater to the WWTP, as the amounts exceed the investment program of the Company many times. The construction of receiving collectors for this wastewater is a priority set in the terms of reference for the regional feasibility studies. The expectations are that the necessary investments will be ensured from the funds under the OP Environment.

1.4.2. WWTP – mechanical treatment

At the WWTP Kubratovo the mechanical treatment encompasses:

- 10 coarse screens
- 10 fine screens
- 3 aerated grit removal chambers
- 4 primary settling tanks

Large materials floating in the wastewater are removed in the processes of mechanical treatment. The larger suspended solids, conditionally called grit, as well as floating particles, are removed in the aerated grit removal chambers. The fine suspended solids, together with the big part of the organic pollutants are settled in the primary settling tanks and then they move to the sludge treatment line.

1.4.3. WWTP – biological treatment

The biological treatment of wastewater is done in 6 aeration tanks with biological and chemical removal of the phosphorous, with preliminary denitrification and nitrification for nitrogen removal.

Following the primary settling, the wastewater is equally distributed to the aeration tanks, as its mixing with the activated sludge takes place in the first zone. This zone during the summer periods serves also for biological removal of the phosphorous, and in the winter – for denitrification zone, as in this period the decrease in the phosphorous pollution is realized by a chemical process, with automatic dozing of the coagulants.

The second zone is the ‘anoxic’ zone where the water enters together with the internally re-circulating nitrified water from the outlet of each aeration tank for the implementation of the denitrification process.

The third zone is the so-called ‘variable’ – in the summer periods it plays the role of an ‘anoxic’ zone, and at water temperatures below 15°C, it is used as a nitrifying zone. The last two corridors of each aeration tank are aerated and serve both to decrease the biological pollution and to nitrify the ammonium nitrogen, for subsequent denitrification and decrease in the nitrogen pollution at the outlet. The internal recirculation of the nitrified water is realized through pumps for internal recirculation at the outlet of each aeration tank. The homogenization in the anaerobic and anoxic zones is realized with mixers and flowmakers.

Each aeration tank is equipped with:

- Measuring devices to measure the dissolved oxygen at four points, including measurement of temperature
- Measuring device for ammonium nitrogen at the inlet
- Measuring device for ammonium nitrogen at the outlet
- Measuring device for phosphates at the outlet
- Measuring device for nitrates at the outlet of the denitrification zone
- Measuring device for suspended solids
- Measuring device for pH.

The data from the measurements are transferred online to the SCADA system and are analyzed by the software for optimization STAR, which subsequently provides the parameters for the operation of the internal recirculation, the dozing of the coagulants, the needed quantity of dissolved oxygen and the age of the sludge.

The mixture of treated wastewater and activated sludge is distributed equally to 10 secondary settling tanks where the settling of the activated sludge takes place and its return through 3 automated pumping stations to the biological stage, and the treated

water is discharged in the Iskar River. Part of the activated sludge is removed from the system in the form of excess sludge and moves to the sludge treatment line.

1.4.4. WWTP – tertiary treatment

The tertiary treatment is realized at the biological stage, described in item 1.4.3.

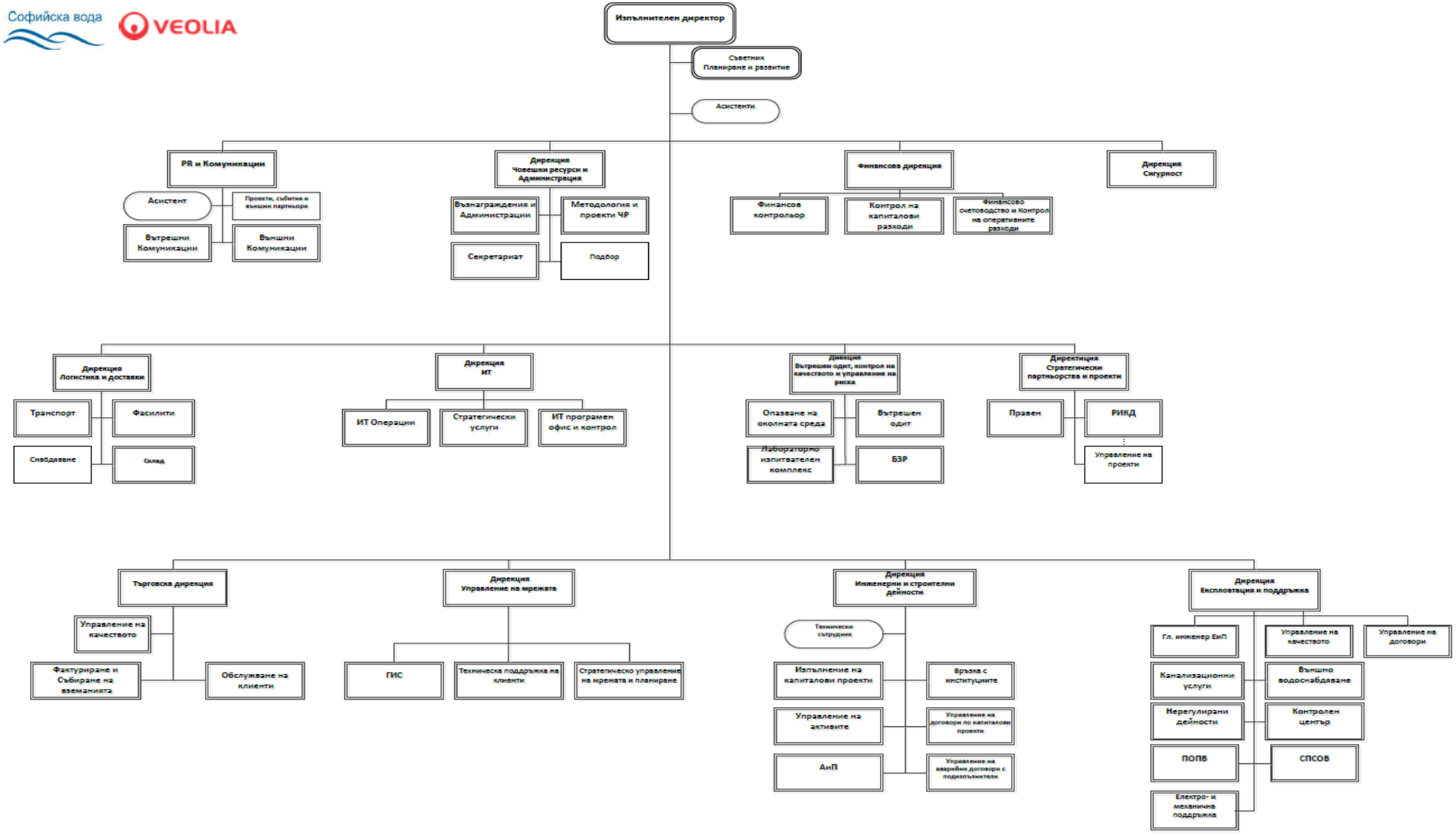
1.4.5 Expected construction and transfer for management of public assets over the period of the business plan (outside the WSS operator investment program)

On the territory of the MoS, where the company operates, at the present time no new wastewater treatment facilities are built funded outside the SV AD investment program. A potential future investor in such facilities is the MoS, but the company does not have information at its disposal regarding concrete investment intentions of the MoS for the next 5 years.

It should be taken into consideration that in the first three to four years of the regulatory period it may not be expected the commissioning of new public assets for wastewater treatment with funding under EU programs. Such assets, probably, could be transferred for operation by the company at the end of the regulatory period at the earliest and will not have a material effect over the operational expenses, nor over the KPIs.

1.5. ORGANIZATION OF THE COMPANY

1.5.1. Organizational Structure – chart, description



The internal policy of Sofiyska Voda regarding the organizational structure of the company aims to ensure effective workflow without duplication or omission of functions and with minimum resource consumption.

Business processes in the company are organized into four formal levels presented in hierarchical order from high to low as follows:

- Directorate, which is managed by a Director and consists of one or several interrelated Departments;
- Department, which is managed by a Senior Manager and consists of one or several interrelated Sectors;
- Sector, which is managed by a Manager and consists of one or several interrelated teams;
- Team, which is managed by a Supervisor or an equivalent position.

The main functional areas in the company are divided into 11 Directorates and one Department that reports directly to the Executive Director. The "Operation and maintenance", "Engineering and construction activities" and "Network Management" Directorates cover the processes related to the management, operation and maintenance of water supply and sewerage network within the concession area as well as the realization of the investment program of the company. Activities related to customer service are united within the Commercial Directorate. Other directorates presented on the chart are administrative in nature and aim to ensure all processes in support of the core business of the company

1.5.2 Geographical organization – operational regions

In terms of operational servicing of the distribution network and the strategic water mains as well as repairing failures and deviations from the normal functioning of the water main network, the territory of Municipality of Sofia has been divided into 6 zones, each one with 4 separate regions and a total of 28 operational regions are given in Appendix *Operational regions*

1.6. EMERGENCY PLANS

1. In the company is developed Plan for continuity of the activity of Sofiyska Voda in case of emergency situations in line with the required standards. The Plan covers the continuity of the activity in the main business directions water supply and water treatment, customer care, including also Central Office:

- Damages or impossible access to premises as a result of unusual natural phenomenon /earthquake, flooding, landslides, snow drifting, icing, fires/;
- Significant losses in the operational activities;
- Losses of critically important, main activities /electricity loss, pollutions etc./
- Interruption and omissions in the activity of critically important suppliers, distributors and third persons, especially when the key activities are outsourced;
- Mistakes of employees, technical failures and serious ecological problems;
- Viruses or other malicious software in the IT systems;
- Industrial actions or other, e.g. loss of key personnel;
- Risk of pandemic /bound to a governmental program/.

Policy for prevention of big failures with hazardous substances is approved and performed.

2. A plan for terrorism counteraction and protection against terroristic activity in Sofiyska Voda is developed for the following dangers:

- Damages or impossible access to premises as a result of terroristic act;
- Significant losses in the operational activities;
- Losses of critically important, main activities /electricity loss, pollutions etc./
- Threat from explosive mechanism;
- Physical and physiological affecting many people through damages caused by chemical substances;
- Viruses penetration or other malicious software in the IT systems.

The Plan has been submitted for coordination with the State National Security Agency.

3. Action plan in case of emergency are developed for all sites of the company. They are approved by the Executive Director and are submitted to external competent state bodies. They are updated and approved every year. Based on the Plans are prepared, approved and executed annual schedules for carrying out of emergency drillings. The purpose is to maintain the preparedness of the employees for actions in case of real emergency situation. All emergency drillings are documented as per the requirements set in a relevant Procedure of the Occupational Health and Safety Management System - Procedure “Preparedness for emergency situations and reaction”. The documentation is kept by the respective authorized persons.

List of the Action Plans in case of emergency situations:

№	Codification	Emergency Plan

1	**Д2-БЗР 4.4.7**	Action plan in case of emergency situation at Beli Iskar Dam
2	**Д3-БЗР 4.4.7**	Action plan in case of emergency situation in External Water Supply Dept.
3	**Д4-БЗР 4.4.7**	Action plan in case of emergency situation at PWTP
4	**Д5-БЗР 4.4.7**	Action plan in case of emergency situation in Sewerage Dept.
5	**Д6-БЗР 4.4.7**	Action plan in case of emergency situation at WWTP
6	**Д7-БЗР 4.4.7**	Action plan in case of emergency situation and fire extinguishing in the Central Office
7	**Д8-БЗР 4.4.7**	Action plan in case of emergency situation in IT Dept.
8	**Д10-БЗР 4.4.7**	Action plan in case of emergency situation in the Laboratory
9	**Д-БЗР 4.4.7**	**Actions plans for the Chlorination Stations:** Boyana, Bakston, Hydro Electrical Plant Passarel, Dragalevtsi, Iztok, Kolezha, Lozenets, Lozishte, Malo Buchino, Moderno Predgradie, Mramor, Passarel, Plana, Simeonovo, Pancharevo

2. OBJECTIVE OF THE BUSINESS PLAN

The main objective of the company for the next 5-year period will be not only to maintain and develop the technical and operational efficiency of the company, but to focus mainly on customer service, as well. A number of innovative measures and projects are planned which are expected to:

- improve and expand the awareness of our customers on various aspects of the company's activities;
- provide more precise and detailed information about the formation of the invoices; carried out interventions on the network, responsibilities and rights of the WSS operator, etc.
- facilitate the access of our customers to the whole spectrum of services which the company offers or plans to offer in the future;
- create a complete experience in our customers that they are receiving quality service from a modern and innovative company, applying up-to-date and efficient methods of customer service and management of the water supply network.

As it has already been emphasized, besides the operational and technical performance, the main focus will be the customer service by providing activities to expand customer awareness, expand and optimize the services provided to increase the efficiency of the customer service centers, to improve the functionality of existing software and the introduction of new. In this regard, the company is planning the implementation of the quality system ISO 9001 in the scope of activities related to customer service.

In order to increase the processes efficiency, the company is envisaging also the introduction of a system of integrated resource planning – ERP, which will cover the activities of the main departments in the company.

3. RESULTS OF THE CONSULTATIONS WITH THE CUSTOMERS OF THE WSS OPERATOR

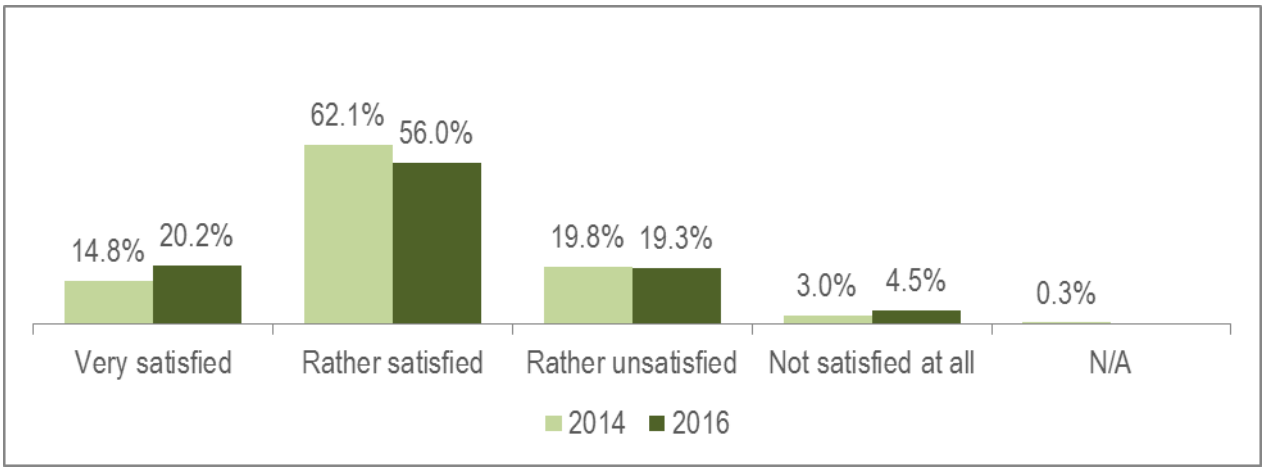
In order to evaluate the customers' satisfaction the company held in April 2016 an external survey to measure the level of the satisfaction from the provided services and feedback to the customers. The survey was organized on the following stages:

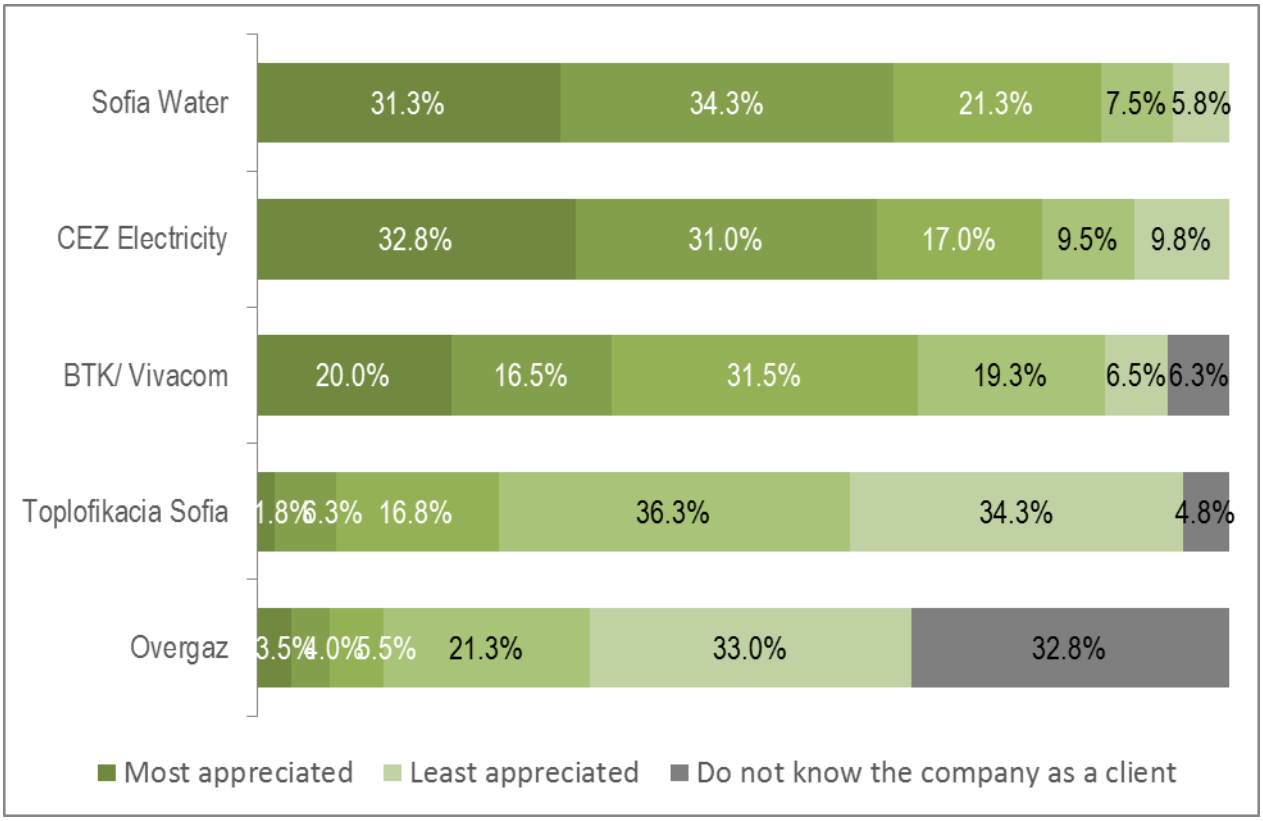
1. Quantitatively survey on 800 customers, whose purpose was to measure customer satisfaction based on a questionnaire addressing several topics related to:
2. Focus groups with different participant – held interviews and asked question on topics related to: quality of the service in the customer service centers, invoices and tariffs, general view on Sofiyska Voda services
3. Interviews with 600 customers visiting the customer service centers

The main results from the survey are presented below

1) Key findings from the quantitative survey:

a. General satisfaction with Sofia water services





The study reveals that:

- Sofia Water continues to be among the most appreciated utility providers in the capital;
- Nearly 1/3 of the respondents position the company as the most appreciated utility company in Sofia and another 1/3 give it a second place;
- In comparative perspective, only CEZ Electricity (and to some respect BTK / Vivacom) receive the same level of positive assessments;
- The company is much better assessed especially in comparison to Toplofikatsia Sofia and Overgas, which are the two providers that generate predominantly negative scores;

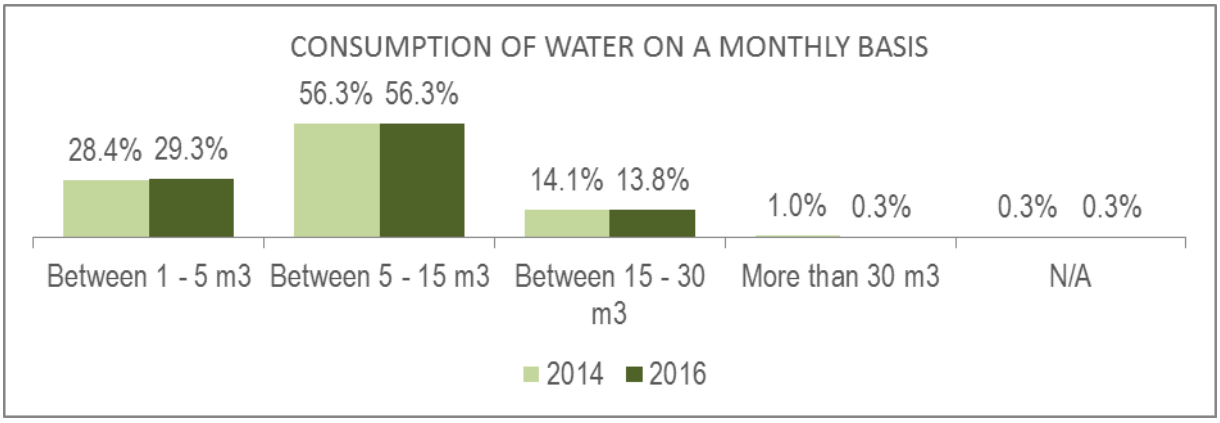
In general, 76% of the interviewed customers share that they are satisfied with the services provided by the company at the moment. In comparison to 2014, the share of those that are very satisfied increased from 15% to 20%.

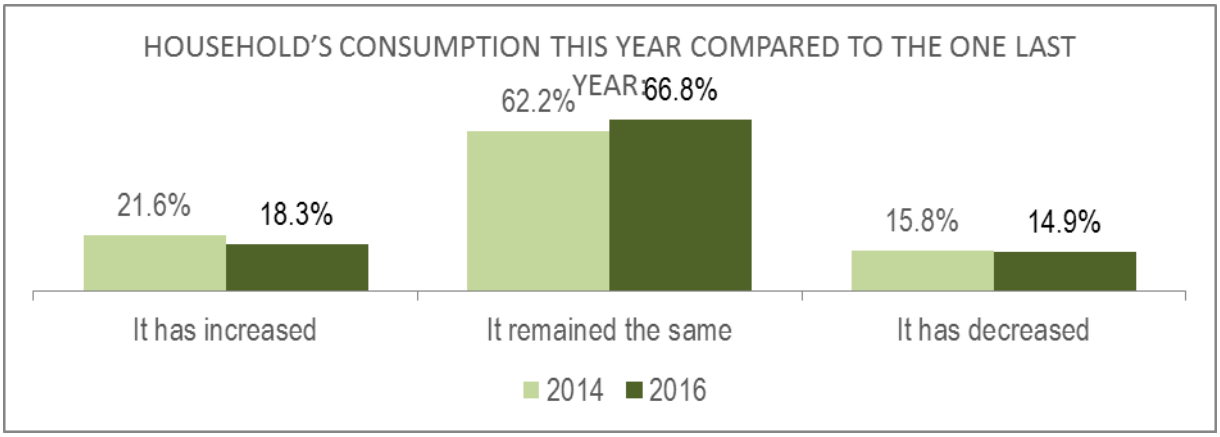
b. Consumption habits and water quality:

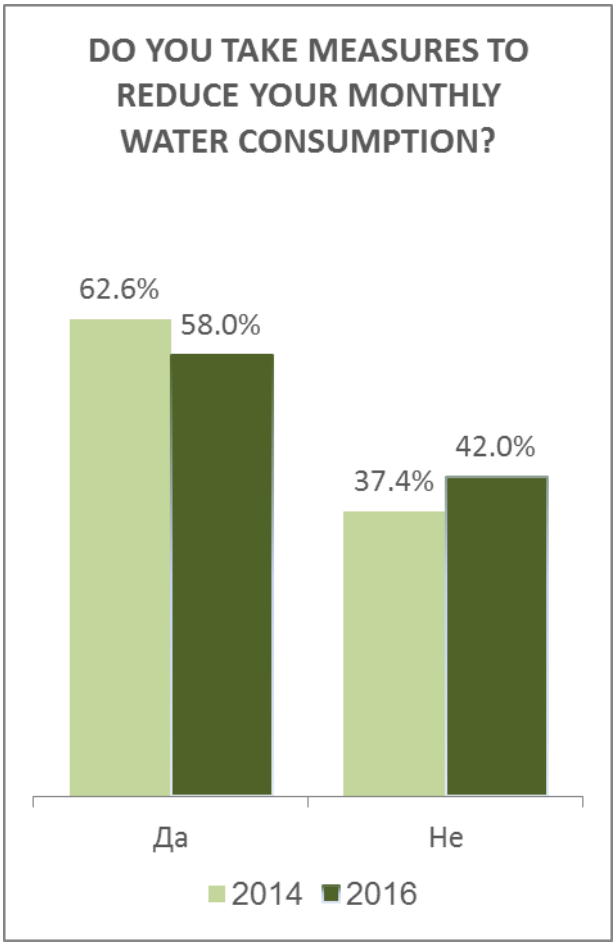
- The usual water consumption of tap water per household on a monthly basis is between 5 m3 and 15 m3. This is the case of nearly 56% of the interviewed. Just 14% share that their consumption is more than that amount and 29% declare not using more than 5 m3 monthly;
- These differences are strongly related to the number of inhabitants of each household. As according to the National Statistics Institute the average number of people that live in one household is nearly 2,4, the usual consumption of water per person per month is calculated at approximately 4 - 5 m3;

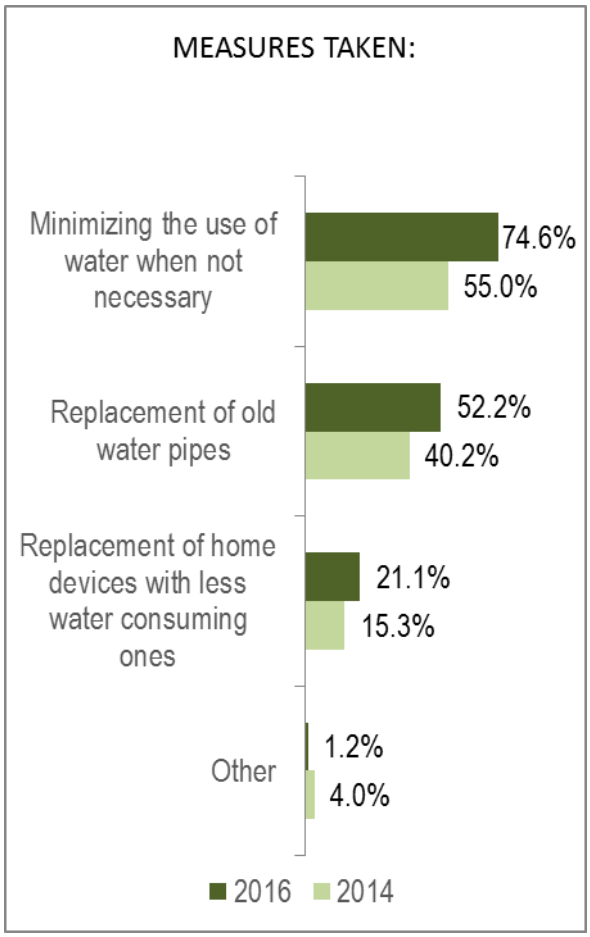
- Today, the majority of the clients (58%) of the company declare that they take measures to reduce their monthly water consumption usually by minimizing the use of water when not necessary (75% of those that take measures) or by replacing old water pipes in the buildings, thus reducing leakages (52% of that group). However, it is worth noting that the share of those that are concerned about their water consumption and monthly bills drops by nearly 5% in comparison to 2014 (63%);
- The indicator for the general satisfaction with the water quality shows that nearly 2/3 (63%) of the clients are satisfied vs. 37% that are unsatisfied. It is worth noting that the assessments concerning the quality of the water vary significantly between different neighborhoods of the city. For example, more critical are the respondents from the districts of Ovcha Kupel, Oborishte, Vitosha, Nadezhda, Vazrazhdane, and Lozenets where more than 60% of the interviewed share low satisfaction with water quality. In the same time the inhabitants that are more positive in their assessments are those that live in Lyulin, Triaditsa, Mladost, Serdika, Slatina and Studentski grad (above 80% satisfaction).
- Despite the fact that 37% of the clients of the company declare that they are unsatisfied with the quality of the water, few of them reported it as a problem in Sofia Water – for the last one year, just 8% of people with problems did that. This percentage is even lower than the one registered in 2014 (12%);
- Yet, the majority of the respondents (69%) continue to drink tap water, most often daily (78%) or at least several times per week (18%). In this respect, water consumption seems stable for the last couple of years. However, those respondents that do not drink tap water (31%) share a bit higher concerns and put forward much more arguments in support of their decision than what the study registered several years ago. These arguments vary from uncertainty concerning healthy issues to such that are directly related to odor and chlorine;
- In this context, almost every respondent is completely aware that the plumbing of the building affects water quality, thus often criticism towards quality it is strongly related to old/bad pipes within the building itself. Today just 44% of the households share that the plumbing in the building is below 10 years old. Although there is some improvement in reference to 2014, there are still a lot of buildings with very old plumbing, sometimes (8%) even 30 years or older;
- In comparison to the tap water, people are much more positive towards the mineral one. Just 14% of the interviewed share that they do not drink mineral water versus 86% that do that frequently;
- Despite the different attitude people have towards tap and mineral water, today the majority of the respondents are confused when asked to compare the price of 1 m3 of tap water vs. 1 liter of mineral one – 55% state that they

are unaware and unable to say which one costs more. This shows that people are rather insensitive towards price when water consumption is concerned.









The study shows that a significant share of customers have a low average consumption and the tendency of taking measures to decrease consumption is still present for more than 50% if the interviewed customers. This supports also our assumptions in the trend of billed volumes for the period of the current Business Plan.

c. Reliability of water supply and sewerage services

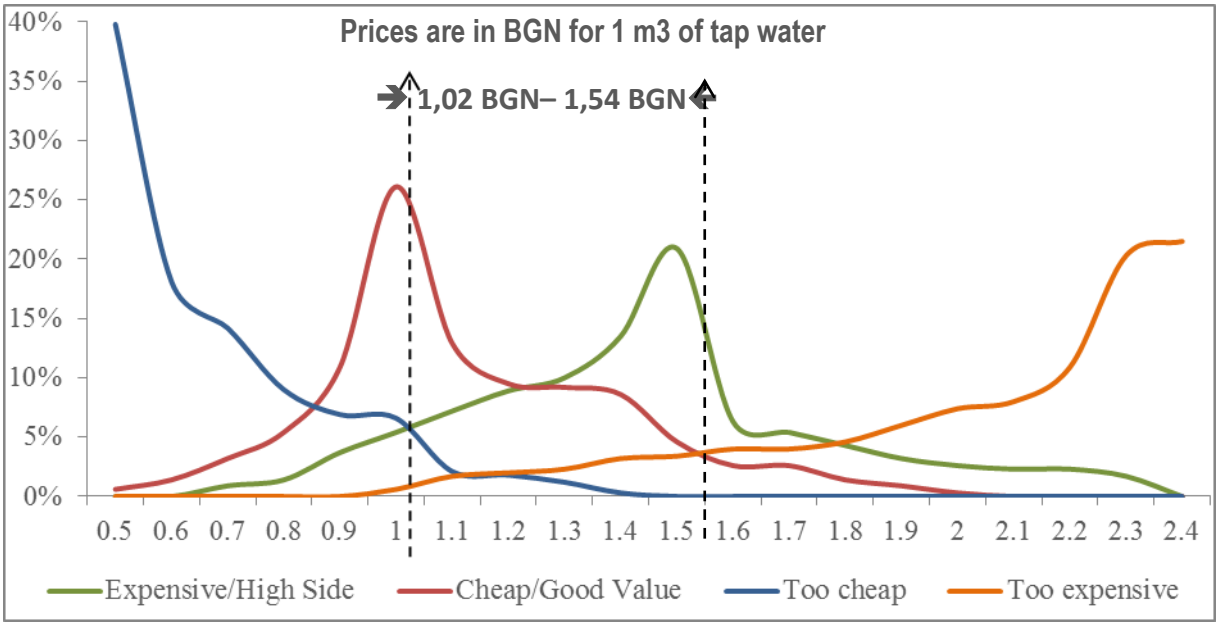
- The continuity of the water supply is an aspect that is being highly appreciated by the clients of Sofia Water. Today, just 6% of the interviewed share some degree of dissatisfaction, which is lower than the 10% share observed in 2014. In the same time, the study registered a significant increase of those clients that are very satisfied with the supply service – from 32% in 2014 to 39% in 2016.
- The first main reason for the observed positive trend is the significant decrease of the reported problems related to supply – from 60% in 2014 to 48% in 2016. Furthermore, people are highly satisfied with the timing for which the interruptions were fixed – supply was restored within 24 hours in 82% of the declared cases of water interruption;
- The second key positive change concerns the accidents and construction works “close to home”, which are also much less common than two years ago – reported accidents drop from 66% in 2014 to 44% in 2016;

- Thus, it is not surprising that today the majority of the interviewed (51%) are finding it hard to recall the last time when the water interrupted in their home and whether or not they were duly informed for the interruption in the case of planned maintenance. As in 2014, the announcement inlet of the building remains the most preferred communication channel for such planed water interruptions;
- If any negative trends are observed in reference to the supply matters they concern the lack of improvement related to sewage services (23% for both 2014 and 2016) and increased dissatisfaction with water pressure (an increase of those clients that are unsatisfied grows from 10% in 2014 to 13% in 2016). Yet, both problems are rather specific for particular city neighborhoods and do not refer to the system as a whole;

d. Price sensitivity

With regard to the customer's opinion on the price of the water, a price sensitivity analysis was performed. The Price Sensitivity Meter (PSM) is a market technique for determining consumer price preferences. PSM approach asks four price-related questions, which are then evaluated as a series of four cumulative distributions, one distribution for each question:

- Which one of the following prices for 1 m3 of tap water is so high for you that you would rather significantly limit your household consumption? (Too expensive)
- Which one of the following prices for 1 m3 of water is so low that will make you think that quality will be terrible? (Too cheap)
- Which one of the following prices for 1 m3 of water is high, but you are still ready to pay? (Expensive/High Side)
- Which one of the following prices for 1 m3 of water is acceptable for you? (Cheap/Good Value)



The study reveals that the price of water before the increase from the 1st of May 2016, was considered as very cheap by all the customers and a good value price can go up to more the 2 BGN / m3 of water. The highest interval between chip and expensive is between 1.02 BGN and 1.54 BGN /m3.

The focus group about prices and invoicing also revealed that customers do not consider the current prices as high, especially based on the circumstance that the amount of the water bill is very low compared to other utilities or other bills which they pay monthly.

2) Results from the customer focus groups

Based on all pros and cons about the company – both on general attitudes or on particular experience, the following main aspects forming the attitudes could be summarized:

Results from the focus groups		
Nr.	Positive opinion	Negative opinion
1	•Good, drinkable water, improvement in quality in the last years;	•Monopolists;
2	•Very good value for money ratio especially when compared with other utility providers;	•Accused for low quality of the finishing repair works after maintenance – road infrastructure in particuliar;
3	•Quick reactions in cases of accidents – water supply restored within the day;	•Provide poor quality of water in particular neighborhoods – muddy, rust, odor;
4	•In general, decreased number of accidents;	•Common needs problem not addressed – satisfaction with the redistribution of the consumed water among all "loyal customers within the condominium";
5	•Very good customer service – variety of channels, easily accessible;	•For specific neighborhoods: frequent accidents and water interruptions;
6	•Polite employees – meter readers and in centers;	•As monopolists, all companies of the kind are alike;
7	•Staff is more polite than other companies– both in centers and the employees who gather water consumption measures at homes;	•Like CEZ interrupt electricity without a notice, same is with interruptions of the water (not always informs for upcoming interruptions);
8	•Offers better value for money services compared to other suppliers (Toplofikacia, CEZ);	•Water is being interrupted more often than CEZ interrupts electricity;
9	•Quick reactions in cases of accidents and immediate fix of the problem (within 24 hours);	•The common meter and the redistribution of the common needs, compared to individual measures for electricity, are a disadvantage for SW;
10	•Respond to every call/contact;	
11	•Aiming at improvement during the past years;	

- In comparison to the other main utility suppliers in the capital, Sofia Water is very well appreciated.
- Today, the overall opinion towards Sofia Water is positive. Customers are rather satisfied with provided services, the continuity of water supply, its price and quality
- When speaking about the company in general, attitudes are often shaped by different stereotypes which circulate in the public domain.
- It is worth noting that few respondents are actually aware of how the company distributes its revenue, what the price of the water actually includes or what the annual investment program of Sofia Water is. The lack of specific awareness is one of the main reason stereotypes, such as the

ones mentioned, to continue to feed unjustified opinions towards the company;

- As a rule, the attitudes / impressions of Sofia Water differ highly depending on the administrative district and the type of housing (either a house or a flat building) respondents inhabit.
- When experience with customer service is concerned, the attitudes are also rather polarized. A part of the respondents are happy with the services provided and state that customer service has significantly improved – “the staff is cooperative and polite, “they try to help as they can” etc. Others express disappointment. In particular, participants report different cases when they were not satisfied with the reactions of SW staff like: water supply restore problems; inconvenient days/hours for water meter readings checks; abuses with water consumption – neighbors stealing water, SW don’t react properly and spread the charges among other users, etc.

3) Key findings from the interviews on the Customer Service Centers

- Overall, the conditions and the atmosphere at the Customer service centers is assessed positively by the visitors as criticism is rather rare – about 2%;
- Most often respondents share that they visit the company’s CSCs once per month (37%) or more rarely (54%) in order to pay their monthly bill (53%), on administrative matters (20%) or just for information (20%);
- Although most of the clients are aware that they can use other available options for the same service, (for example, call center or the web site for information, submitting water meters readings or complaint), most of the visitors say that they come to the company’s CSC as they prefer the personal contact. Similar arguments are put forward with regard to bill payment – although 60% are aware that they can use Easy pay / Fast pay services or to pay their bill at the post offices (37%), through bank transfer (26%) or via Internet (17%), they prefer to do it personally at CSC location. Most of these clients have been doing it for many years, and for them, this practice has become a monthly routine;
- The service offered at the CSC locations is of a high quality. The vast majority of the respondents (93%) are very or at least rather satisfied with the service time and about 96% with the attitude of the employees. Similar trends are also observed with regard to provided services and information – more than 95% satisfaction;
- The average waiting time before service for all locations is about 9 min. as every 4th client does not wait at all. The fastest service is at CSC Zona B5 (2 min on average and 84% immediate service) and the slowest one at CSC DAG (18 min on average and 21% immediate service);
- Last but not least, the majority (73%) of the CSC visitors find the current services offered as sufficient vs. 13% that would appreciate some more

available ones (2% find the current services as more than necessary and 12% find it difficult to decide). In this context, from all four new concepts for additional services to be offered at the CSC, the one concerning the availability of a front desk for fast service (limited only to particular options) receives the highest support (82%). All three others are perceived as suitable by nearly 2/3 of the respondents.

The study provides also meaningful information with regard to the profile of visitors in the customer service centers, the reasons of their visits and their opinions about the current locations and services provided. It is used also as a basis for determining the proper configuration of the customer service centers network, in view of providing more services in more appropriate locations.

4. DESCRIPTION OF THE RELATIONSHIP OF THE BUSINESS PLAN WITH THE REGIONAL MASTER PLAN OF THE SEPARATED TERIROTY FOR SUPPLY OF WSS SERVICES

During the development of Business Plan 2017-2021 and determination of specific projects in the company's investment program are taken into account estimates for the development of WSS systems in the Master Plan of the city of Sofia, Strategy for the development of the technical infrastructure of Municipality of Sofia as well as the investment priorities of the Grantor regarding the sewerage network. In connection with the development of the sewerage network a correspondence with MoS has been exchanged and the company received a list of indicative projects, some of which were included in the Business plan of the company.

5. DESCRIPTION OF THE RELATIONSHIP OF THE BUSINESS PLAN WITH KPI'S WHICH ARE ENVISQAGED UNDER THE CONTRACT WITH ASSOCIATION

According to Art. 16.1 of the Concession Agreement between Sofiyska Voda JSC and Municipality of Sofia "The Concessionaire shall subject to the terms of this Concession Agreement throughout the Concession Term provide the Services in accordance with the Law in order to procure the satisfaction of the Levels of Service".

Meanwhile Levels of Service according to definition given in Concession Agreement are "the key performance indicators (KPI) approved by the Competent Authority and set out in the Business Plan".

Thus, in practice, the agreement with the Contracting Authority does not determine quality indicators, other than those specified by applicable law, while the target of these quality indicators are determined by EWRC. The present Business Plan defines the approach and how to achieve the levels of key performance indicators set by EWRC.

II. TECHNICAL PART

1. PROPOSAL FOR THE INDIVIDUAL ANNUAL LEVELS OF THE KPIs OF THE WSS SERVICES

The proposed by SV levels of the quality of the supplied WSS services for the period 2017-2021 are presented in Reports No 2 and No 3.

Sofiyska Voda JSC plans the levels of the KPIs for the new regulatory period 2017-2021 in compliance with the Ordinances on regulation of the quality and the price of the WSS services promulgated on 22.01.2016, the Instructions for its implementation (adopted with the Protocol of the EWRC on 19.04.2016), as well as the instructions for the calculation, described in the e-model of the Business plan.

According to the new legislation, the KPIs for regulating the quality are 15 (main ones) and the Energy and Water Regulatory Commission (EWRC) determines the individual levels which each WSS operator should reach at the end of the regulatory period.

The levels of individual indicators determined for Sofiyska Voda are the following:

№	KPI	*Parameter*	Unit measure	Individual target for 2021
1	***KPI1***	*Level of coverage of water supply services*	*%*	***99%***
2	***KPI2a***	*Quality of potable water in large water supply areas*	*%*	***99%***
3	***KPI2b***	*Quality of potable water in small water supply areas*	*%*	***98%***
4	***KPI2c***	*Monitoring of the quality of potable water*	*%*	***100%***
5	***KPI3***	*Continuity of water supply*	*ratio*	***-***
6	***KPI4a***	*Total water losses in the water supply systems*	*m3/km/day*	***45.59***
7	***KPI4b***	*Total water losses in the water supply systems*	*%*	***42.22%***
8	***KPI5***	*Failures on the water supply network*	*nos./100 km/year*	***87.13***
9	***KPI6a***	*Pressure in the water supply system*	*%*	***80%***
10	***KPI7a***	*Level of coverage of sewerage service*	*%*	***-***
11	***KPI7b***	*Level of coverage of wastewater treatment service*	*%*	***-***
12	***KPI8***	*Quality of wastewater*	*%*	***93%***
13	***KPI9***	*Failures on the sewerage network*	*nos./100 km/year*	***159.24***
14	***KPI10***	*Floods in the properties of third parties, caused by the sewerage network*	*nos./10 000 customers*	***-***
15	***KPI11a***	*Energy efficiency of water supply activity*	*kWh/m3*	***0.03***
16	***KPI11b***	*Energy efficiency of wastewater treatment activity*	*kWh/m3*	***-***
17	***KPI11c***	*Utilization of sludge from wastewater treatment plants (WWTP)*	*%*	***90%***
18	***KPI11d***	*Rehabilitation of the water supply network*	*%*	***1.09%***
19	***KPI11e***	*Active control of leaks*	*%*	***16.02%***
20	***KPI12a***	*Cost-effectiveness of the water supply service*	*ratio*	***1.1***
21	***KPI12b***	*Cost-effectiveness of the sewerage service*	*ratio*	***1.1***
22	***KPI12c***	*Cost-effectiveness of the wastewater treatment service*	*ratio*	***1.1***

23	***KPI12d***	*Collection rate*	*%*	***95.70%***
24	***KPI12e***	*Efficiency of setting the water meters in validity*	*%*	***14%***
25	***KPI12f***	*Efficiency of establishment of the revenue meters*	*%*	***87.83%***
26	***KPI13***	*Deadline for responding to written customer complaints*	*%*	***100%***
27	***KPI14a***	*Connection to the water supply system*	*%*	***100%***
28	***KPI14b***	*Connection to the sewerage system*	*%*	***100%***
29	***KPI15a***	*Staff efficiency with regard to the water supply service*	nos./1 000 WSC	***6.01***
30	***KPI15b***	*Staff efficiency with regard to the sewerage and wastewater treatment services*	nos./1 000 SSC	***4.18***

In the present part a brief clarification on the levels of KPIs of the Business plan 2017-2021 is presented:

- **Level of coverage with water supply service** – for calculating this KPI official statistical data from the National Statistical Institute is used, according to which 100% of the population on the territory of the Municipality of Sofia (MoS) is covered with water supply services. The total population of the serviced area is again calculated based on projections of the NSI. NSI forecasts a total increase for the period 2015–2020 of 40,608 inhabitants for the territory of the MoS (from 1,319,804 inhabitants in 2015 to 1,360,412 inhabitants in 2020), or an average annual increase of 8122 inhabitants. For 2021 the company has again used the forecast of the NSI, but for the period 2020-2025, where the average annual increase has decreased to 6524 inhabitants. Thus, in practice, for the population served in 2015 is applied a rate of increase of 0.62% for each year until 2020, and for 2021 is applied an increase of 0.48%.The long-term level of this KPI has been achieved by the company, as there is 100% coverage for the serviced population.

  The company has presented additional information in reference to it. 2.6 of EWRC letter, Incoming Ref. №СВ-1677/19.08.2016, regarding the manner of projecting variable E10 – number of customers of the service - water supply and the relation to the data presented for population serviced in the period 2017-2021, namely:

Description of the indicator	Unit of measure	Value of the indicator		Difference 2015/2021, %
		2015	2021	
Total number of population registered at permanent address and using the service water supply to customers in the define district serviced by the WSS operator	number	1 319 804	1 366 936	3,57%
Total number of customers serviced by the Operator who use the water supply to customers.	number	617 197	655 970	6,28%

The total number of population registered with their permanent address is according to the officially published statistics for the number of the

population by the NSI for 2015 as well as the forecasts for the rest of the period and in accordance with art. 45.3. from the Instructions on Regulation of the Prices of WSS Services through the price cap method for the regulatory period. The difference in the growth trend between the number of the serviced population and the total number of customers is due to two facts: on one hand, actuals and forecast data are compared. On the other hand, the company expects higher growth in the number of customers. This is due to the fact that at the time when the BP was prepared, there is still high number of block of flats (507 nos.) without individual accounts which are read and billed only on the basis of the readings of the revenue meter. The company conducts an information policy on the advantages of the individual accounts that targets the inhabitants of these blocks. When individual accounts are opened - having one and the same number of inhabitants in the condominium (serviced population), the number of individual customer accounts (customers) increases.

In reference to it. 2.2 of EWRC Letter Ref. № CB-1677/19.08.2016 Sofiyska Voda presented additional information on the forecasts made for 2017 – 2021 for variable **C24** Total number of WSC, with the specification that the company has been building over 300 new WSC per year in the past 3 years. At the same time, the company is terminated a great number of existing WSC, which neutralizes the effect of the construction of new connections.

Type of activity	2011	2012	2013	2014	2015
Applications for connection	266	273	350	362	344
Terminated connections	460	425	454	385	400

The most frequent reasons for termination of service connection are:

- construction of a new building after destroying existing buildings (multi-floor residential or business building, after destroying an existing 1- floor and 2-floor premises)
- implementation of projects for urban development when pavilions, separate buildings etc are being disconnected;
- ascertained leaks from partially disconnected in the past water service connections;
- uninhabited and half demolished buildings;
- determined unauthorized water consumption;
- termination due to a debt, when all other means for debt collection have already been used;
- Other cases when it is necessary to terminate existing connections

In view of the reasons stated above, the increase of the customers and the serviced population is not related to the increase of the number of service connections and it is valid to the greatest extent for the urban areas in

which the construction of multi-floor residential buildings and/or commercial centers has shown a tendency for considerable increase over the last years.

- **Quality of potable water in large water supply areas and quality of potable water in small water supply areas** – the long-term levels of the quality of potable water of both sub-indicators were achieved by the company as at 2015. As no individual target levels have been determined, different from the long-term levels, for each year in the period 2017-2021 the company has set the long-term target levels;
- **Monitoring of the potable water quality** – the level of the KPI achieved to 2015 is 100%. The envisaged monitoring has been accomplished in all small and large water supply areas. For the regulatory period it is planned the indicator to keep this level;
- **Continuity of the water supply** – the level achieved of the KPI in 2015 (0.52) is considerably better than the long-term for the KPI (8). For the business plan period a decrease has been envisaged in the number of the population affected by water supply interruptions by 5% on average. The expected improvement of the KPI level is related to the increase in the efficiency of the water supply network and decrease in the areas, respectively the population affected by all types of water supply interruptions;
- **Total water losses in the water supply systems** – each year the company makes considerable efforts to decrease the total losses in the water supply network by applying good engineering practices and investing funds for improvement of the state of water mains. The level achieved for Total Water Losses Q9 in 2015 for all water systems (excluding WS “Non-potable water|”) was 48%, and for the period of the Business Plan a gradual decrease in the specific losses has been envisaged for the achievement of the individual level of 38.88%, as set by the Regulator. On 15.06.2016, the Commission sent a new version of individual targets where Q9 is at a rate of 4222%. As the reduction of water losses is one of the main priorities of the company, the long-term goal that Sofiyska Voda JSC envisaged in the draft Business plan was originally proposed by EWRC - namely 38.88%.

  The decrease of Q9 also leads to decrease of the specific water losses, for which the fixed individual level is 37.22 m^3/km/day.
- **Failures on the water supply system** – In view of the incessant efforts to decrease the water losses, during the years the company has displayed a positive tendency in diminishing the failures along the network, as in 2015 the level achieved was 108.91 nos./100 km/year. The reasons for this are the constant planned replacement of water pipe sections, decrease in the

areas with water supply interruption and pressure management. For the period of the business plan around 40 km on average are envisaged for replacement and rehabilitation of the water supply network per year, which when keeping the tendency for decrease in the number of failures compared to preceding years should lead to compliance with the individual level of 87.13 total/100 km/year;

- **Pressure in the water supply system** – for this indicator the EWRC has identified the same forecast for all water companies - 80%. By 2015, the company has achieved a level of 93.69%, i.e. level to the base year is higher than those established for the sector level. Over the 2017-2021 it is envisaged an increase of the indicator, as measures were planned to gradually increase the number of zones with constant measuring pressure and flow up to the achievement of level of 98.06% in 2021;
- **Level of coverage of sewerage service** - The population using sewerage services has been calculated as the customer numbers with “Sewerage” (553 598 for 2015) service are multiplied by the average number of persons in a household (2.2 using data of NSI) which is 92.28% sewerage coverage. For the 2015 the level of this KPI is 92.28%, which exceeds the long-term level of 75%. As a result of the planned in the investment program projects for expansion of the sewerage network, an increase in customer numbers with service "Sewerage" is envisaged. At the end of the regulatory period it is envisaged that the level of coverage of sewerage services to reach 96.48%

  In relation to the new calculation of this key indicator as required by EWRC, we would like to draw attention to the fact that according to the latest data of the NSI, the level of coverage of sewerage service in Sofia is 95.91% for 2014. The calculation of this KPI according to the new instructions, namely, multiplying customer IDs with the average number of members in the household, yields a level of coverage for 2015 much lower than that indicated by the NSI.

  In reference to an inquiry made by the EWRC, in its reply under it. 2.5 of the letter, the Company expressed its opinion that the number of SSC is not directly contingent on the increase of the number of customers.

  Such a dependence is not found in the company’s reported data for the last few years as well:

Indicator	2013	2014	% variance	2015	% variance
Total number of customers using sewerage service	532 358	549 780	3.27%	553 598	0.69%

Total number of SSC	72 224	72 701	0.66%	73 022	0.44%

In addition to the stated above the increase of the number of customers is mainly in the urban area of the concession territory and in particular in residential buildings. In the cases of opening of individual accounts in condominiums, the customers increase with a lot higher percentage than the number of sewer service connections.

The estimate for the number of SSC corresponds to the calculation of the estimate for the length of the sewerage network for the regulatory period. The same is formed by including SSC, envisaged for construction in the scope of the projects for extension of the sewerage network in accordance with an investment program

- **Wastewater quality** – the long-term level of the KPI was complied with in 2015. There is no defined individual target level for the period 2017-2020. The company is planning to achieve 100% compliance of the quality of treated wastewater for the entire period of the Business Plan.

  The variables needed to calculate this key performance indicator (28 samples per year) are determined in accordance with the current instructions, taking into account the number of samples testing the quality of treated wastewater required under the discharge permits. For the period 2017–2021, there will be two permits applicable for discharge of treated wastewater – the current for WWTP "Kubratovo" and the forthcoming to be given to LWWTP "Voinyagovtsi." The required annual number of samples for WWTP "Kubratovo" according to the permit is two samples per month or a total of 24 samples per year. The requirement for authorization of LWWTP "Voinyagovtsi" is a provision of 4 samples per year according to the monitoring requirements of Ordinance №6 for emission standards for permissible content of harmful and dangerous substances in waste water discharged into water bodies.

  Sofiyska Voda JSC plans, as it is already doing, to continue carrying out daily monitoring of the quality of treated wastewater for WWTP Kubratovo in accordance with the plan for self-monitoring as well as to implement an adequate plan for self-monitoring of LWWTP "Voinyagovtsi", depending on the technological characteristics of the facility after putting it into operation and loading it with real water quantities.

- **Failures on the sewerage network** – the individual level for this KPI defined by EWRC for Sofiyska Voda JSC for 2021 is 159.24 failures / 100 km / year.

The forecasts of the Company are for keeping the current level of the number of failures on the sewerage network due to structural destroying of the sewer for the entire period of the Business Plan and also for a smooth decrease of the levels of blockages of the sewerage network, other than those in the sewer service connections (from 1146 in 2015 to 1088 in 2021), as well as the blockages in the sewer service connections (from 1643 in 2015 to 1599 in 2021). In the variable wC1 "total length of the sewerage network operated by the WSS operator" are reflected forecasts for the change in length of the network associated with the planned implementation of investment projects for the period 2017-2021.

In relation to it. 2.7 of EWRC letter Ref. №СВ-1677/19.08.2016, Sofiyska Voda made additional clarifications regarding the projection data on length of the sewer network, as well as a comparison between the submitted data in the initial version of the Business Plan and those enclosed to letter sent to the Commission, Our Ref. № СВ-1677 dated 05.08.2016:

№	Indicator	Unit of measure	2015	2016	2017	2018	2019	2020	2021
1.	Extension of the sewerage network under an IP, included to variable wC1 in submitted BP 2017-2021 / 30.06.2016	Km			3.441	1.971	4.222	1.804	1.387
2.	Other projects (Bankya), included to variable wC1 in the submitted BP 2017-2021/30.06.2016	Km			39				
3.	Variable wC1	Km	1677	1673	1719.441	1721.412	1725.634	1727.438	1728.825
4.	Appendix 2 /submitted with ref No CB-1677 / 05.08.2016 to the EWRC/	Km			2.537	1.971	3.227	1.422	0.887
	Difference between No 1 and No 4:	Km			0.904	0	0.995	0.382	0.5

* For 2017 variable wC1 was calculated by adding the extension for Bankya and other projects under IP to the length of the sewerage network from 2015 as the same has a bigger value compared to the network for 2016

The focus of Appendix 2, additionally requested in letter of the EWRC Ref. №В-17-00-8/26.07.2016, it. 1, is on sites having an effect over invoiced volumes, due to which in the Appendix only such sites have been reflected,

namely new sewers, to which customers will be connected, to whom respectively sewerage and wastewater treatment will be billed.

Other than such sewers, the company also constructs sewers, to which customers are not connected:

→ Storm-water sewers – construction of separate sewers has been planned in Benkovski r.q.
→ Outflow channels – currently in construction; in 2017 in operation will be outflow channels along Arsenalski Blvd. – from Bogatitsa Str. to discharging in Drenovichka River, MoS- Lozenets Region and on trunk sewer IV, Gorublyane r.q., MoS - Mladost Region. Also an outflow channel along Samokovsko Chaussee, Gorublyane r.q., MoS - Mladost Region has been planned for construction.
→ Sections of the domestic sewage network, to which to the moment no customers are connected, but which are necessary for the functioning of the system – the construction of a connection has been planned between the trunk sewer along Daskal Stoyan Popandreev Str. and an existing trunk sewer along Bulgaria Blvd., Boyana r.q., MoS - Vitosha Region.
Exactly to such elements from the sewer network planned for construction in the period 2017 – 2021 the difference is due between the lengths of the newly built sewer network in Appendix 2 and in Report 2, variable wC1.

The specified in Report 2 new WSPS in 2018 has not been included in Appendix 2 for similar reasons. The new WSPS “Vladaya”, which is an element of the project on water supply of Vladaya village from the water supply network of the city of Sofia, from whose implementation no impact is expected on the billed quantities, as it does not lead to the connection of new consumers.

- **Floods in the properties of third parties** – there is no defined individual target level by EWRC and the long-term level is 0.5 complaints about flooded estate / 10 000 users. The reported level by the company for 2015 is 0.13. The forecast in the Business plan is consistent with the values already achieved in 2015, and a trend has been set for a slight improvement of the KPI; towards the end of the regulatory period 2017-2021 is predicted level of 0.11.
- **Energy efficiency of water supply activity** - the defined individual target level is 0.03 kilowatt hours/m3 which is 15 times lower than the long term level of the indicator (0.45 kilowatt hours/m3). The level achieved by the company in the base year 2015 was 0.03 and the plans are for this level to be kept for the entire period of the Business plan.
- **Energy efficiency for the wastewater treatment activity** – There is no defined individual target level, and the long-term level of the indicator is

0.25 kilowatt hours/m3. The company forecasts compliance with levels of energy efficiency for wastewater treatment of about 0.13 kilowatt hours/m3 which is almost twice better than the long-term level of the indicator.

- **Utilization of the sludge from WWTP** – the long-term level of the indicator, which must be achieved by the WSS operators at the end of the regulatory period is 90%. The company predicts 100% utilization of the sludge, which should be achieved in 2017, and respectively to keep this level until the end of the regulatory period.
- **Rehabilitation of water supply network** - the achieved level for this indicator in 2015 is 0.91%, and the individual level set is 1.09%. In order to achieve this KPI the company envisages average annual rehabilitation of around 40 km of water supply network (impounding structures and distribution water mains).

  For calculation of the variable - Total length of the rehabilitated water supply network (D20), the company includes the following activities replacing and upgrading the distribution water mains and the impounding structures:

- Rehabilitation by replacing sections of impounding structures;
- Rehabilitation of sections of impounding structures using technology "Phoenix" (CIPP);
- Renovation/rehabilitation of impounding structures by providing cathodic protection;
- Replacement of sections of pipelines with a length up to 2 m;
- Replacement of sections of distribution water mains with a length of 2 to 10 meters;
- Rehabilitation of sections of distribution water mains with a length of 10 to 60 meters;
- Rehabilitation of sections of distribution water mains with a length of over 60 meters.

  As the water supply network of the Municipality of Sofia is practically built, its expansion is rather sporadic and is compensated by the length of the excluded pipelines. For this reason, the value of the variable C8 - Total length of the water supply network, is assumed to remain constant throughout the whole 5-year period - 3815 km.

  The most frequent reasons for the decommissioning of existing water mains are:

  - reconstructions of existing water maims;
  - improved water supply schemes;
  - exclusion of relief water mains;

- exclusion of water mains passing through private properties;
- termination of unnecessary connections between existing water mains
- relocation of water mains for operational reasons etc.

	2010	2011	2012	2013	2014	2015
Accumulated length of the water supply network, which is not operated (km)	394.52	449.79	561.51	566.18	604.07	645.83
Difference compared to the previous year (km)		-55.27	-111.72	-4.67	-37.89	-41.76

To the mentioned above should be added also the length of the analytically calculated network, which despite the clearly distinct tendency for reduction is still a considerable share of the length of the water supply network.

Analytically calculated network	2011	2012	2013	2014	2015
Length (km)	648.76	621.25	604.93	596.59	401.23
Length (% from the length of the network)	16.01%	15.46%	15.03%	14.80%	10.11%

In relation to it. 2.1 of EWRC letter Ref. № CB-1677/19.08.2016, Sofiyska Voda provided additional information in reference to the forecasts made for the period 2017-2021 for variable **D20** Total length of the rehabilitated water supply network.

In Report 9 “Investment Program” only the length of the water mains that will be rehabilitated with investment funds was shown, i.e. the rehabilitation of water mains under 10 m in length was not included Pursuant to art. 34 of the Instructions of the Commission on the Application of the Ordinance on the Regulation of the Quality of WSS Services “*in the calculation of D20 the lengths of the replaced and upgraded distribution mains and impounding structures are added*”. On the other hand, the definitions of the terms “renewal of the water supply network” and “replacement of the water supply network” in the additional provision of the Ordinance on regulation of the Quality of the WSS services are not linked with a requirement for the length of the rehabilitated asset or the rehabilitation method. The Company made a clarification that during data verification an error had been established in the input of the lengths of the rehabilitated impounding structures in 2017 and 2018 in Report 9 “Investment Program”, shown in the following table:

		2017	2018	2019	2020.	2021
Impounding structures – in submitted report 9 to BP 2017-2021	m	17 706	7 550	1 150	500	300
Impounding structures – corrected values	m	17 250	6 750	1 150	500	300

The error has been corrected, it is a technical error and does not have an impact on the value of variable D20.

Under it. 2.3. of the same letter the Company made the specification that despite the construction of new water mains as part of the investment program, in the reconstruction of existing water mains and the optimization of the network, each year around 50 km of water mains are disconnected.

Regarding Vladaya project the length of the water main, envisaged for construction, is 4 km and the total length of the water supply network is 3, 815 km. In other words its adding does not have a significant impact on the variable especially taking into consideration the text above, namely reducing the length of the water supply network as result of survey.

The higher value of the indicator in 2017 is linked to the investment intentions of the company to realize cathodic protection of the pipeline "Iskar" with a length of 12 km.

In conclusion, the Company plans to achieve the determined individual potable water KPI 11d at the end of the regulatory period.

- **Efficiency of setting the water meters in validity** - for this indicator the level set by the Regulator is 14%.

  As at 31.12.2015, Revenue meters, maintained by Sofiyska Voda consists of 112 486 points of water supply, which must be measured by revenue meters for potable water for commercial purposes.

  Of these, the company measures and bills consumption of 102 958 water meters, and the difference of consumption, where such exists, is billed as provided in the regulatory framework.

  In an opinion submitted by Sofiyska Voda to the EWRC in connection with the determination of individual quality indicators of water and sewerage services, the company argued for the need to change the reporting of parameter iE6 Total WSC meters (measuring devices), namely - 102 958 water meters. The change of the reported value is necessary because in the new report the actual number of meters used for commercial purposes will be given, while in the previous regulatory period the company reported the number of points where it supposedly had water meters.

  Considering that the already reported data for 2015 and 2016 is based on the current model of reporting Parameter iE6, and are not part of the scope of the BP period, they will not be changed retroactively.

  The forecast for the period 2017-2021 is based on the new calculation of the value that takes into account the variable iE6 - number of water meters used for commercial purposes. The annual level of the indicator since 2017 is 16.50%, and it is planned to be maintained at this level until the end of the regulatory period.

**Further clarifications in this regard are presented in section 5.11.2 Schedule for the period 2016 - 2021 for follow-up checks of water meters of customers in accordance with the Law on measurements*.

In reference to it. 2.4 of EWRC letter Ref. № CB-1677/19.08.2016 Sofiyska Voda presented the following additional clarification on the manner of forecasting variable iE6 – total number of water meters on WSC:

№	Description of the indicator	Unit of measure	Value of the indicator						
			2015	2016	2017	2018	2019	2020	2021
iE6	Total number of water meters on water service connections (measuring devices)	nos	112 486	111 500	103 000	103 500	104 000	104 500	105 000

In an appendix to letter, Outgoing Ref. № CB-1677/03.06.2016, the Company presented justification of the need of change in the reporting of this KPI for the new regulatory period. Respectively, for the forecast period 2017 – 2021, the data has been formed based on the new approach, namely – real number of water meters for commercial measuring. For 2015 and 2016 the data have been calculated in the old manner and have not been modified as they are contained in the annual report of the Company for 2015, as well as in the Business Plan for 2016 approved by the EWRC.

In the table below we have enclosed data for the actual number of the water meters used for commercial measuring, including data for 2015 and 2016.

№	Description of the indicator	Unit of measure	Value of the parameter						
			2015	2016	2017	2018	2019	2020	2021
iE6	Total number of water meters on water service connections (measuring devices)	nos	102 958	103 000	103 000	103 500	104 000	104 500	105 000

As evident from the table above when a common approach for calculation is applied for the entire period 2015-2021, the number of the water meters on WSC is increasing. For 2016 the total number will be specified in the annual report for 2016.

- **Staff efficiency with regard to the water supply service; Staff efficiency with regard to the sewerage and wastewater treatment services** – The individual levels set for these two key indicators are as follows - 6.01 and respectively, 4.18 pcs. / 1000 WSC, with achieved levels in 2015 - 5.94 and 3.64.

  It should be clarified that according to the requirements of the EWRC, reporting on these indicators is done on the basis of full-time equivalent

employees, while planning is based on staffing schedule, which complicates comparability of the forecast and reporting data.

After exchanging additional correspondence with the EWRC, Sofiyska Voda AD corrected the values of the KPIs Efficiency of the personnel for the service water supply and efficiency of the personnel for sewerage and treatment, as the respective corrections have been reflected into the electronic model of the Business Plan.

Additional information regarding the method of forecasting the number of personnel and the used methodology is provided in sections 5.7 and 5.8, where the staff efficiency is analyzed.

It is necessary to emphasize that all data regarding the respective key indicators are presented in Report 2 and Report 3 of the electronic models, and because of the specifics of the models, some of the indicators present data for WS Sofia only (as indicators of expenditures, losses, and energy efficiency), while others - like performance indicators of staff - combine data for the four water supply systems. The rest of the KPI information presents summarized data for the three systems / WS Sofia, WS Bozhurishte, WS Beli Iskar/.

2. ANALYSIS AND PROGRAM FOR ACHEIVEMENT OF THE KPIS FOR POTABLE WATER SUPPLY SERVICE

2.1. ANALYSIS OF LEVEL OF COVERAGE WATER SUPPLY SERVICES

Sofiyska Voda JSC provides 100% coverage of water services on the territory of Sofia Municipality, which covers an area of 1348.9 km².

Furthermore, Sofiyska Voda JSC supplies:

- Raw water ViK EOOD - Sofia District for the needs of Samokov, Borovets and several smaller settlements (Govedartsi, Madzhare, Mala Tsarkva, Relyovo, Rayovo, Belchin and Alino);
- Treated water for the needs of the town of Bozhurishte;
- Non-potable water for the needs of the industrial enterprises on the territory of Sofia Municipality.

As of 2015, the customer data base of the company includes 617,245 customer numbers using the water supply service, which covers the four water supply systems.

2.2. ANALYSIS OF THE QUALITY OF THE POTABLE WATER IN BIG ZONES OF WATER SUPPLY

When the KPI 2a is estimated all big zones of water supply are considered. These are zones where over 1 000 m³ for twenty-four hours are distributed. In the zones are

included 76 points for monitoring on the water network. The long-term level of ПК2а is 99% and presents the ratio between the number of analysis of the potable water quality in big zones of water supply for the reporting year which correspond to the requirements of Ordinance № 9/ 16.03.2001 and the total number of analysis of the potable water quality in big zones of water supply with excluded analysis which show deviations permitted by the ordinance on art.135, p.3 from the Water Act.

The variables (iD51a и D51a), forming this indicator, present the sum of the laboratory analysis by different quality indicators of the water in big zones of water supply defined in Appendix № 1 of Ordinance № 9/ 16.03.2001 for the quality of the water used for potable needs where are included indicators with indicative meaning, physicochemical indicators and microbiological indicators. The variable iD51a gives the number of laboratory analysis on indicators for the quality of water corresponding to the legal requirements. The variable D51a gives the total number of laboratory analysis for the same indicators for the quality of water required by Ordinance № 9/ 16.03.2001.

The number of samples taken as well as the number of laboratory analysis are legally defined and coordinated with the Sofia Regional Health Inspectorate. The frequency of sample taking and analysis for each point for monitoring in Sofia and the region are defined as it depends on the water volumes supplied to the respective area in accordance with the requirements of Ordinance № 9.

2.3. ANALYSIS OF THE QUALITY OF THE POTABLE WATER IN SMALL ZONES OF WATER SUPPLY

When the KPI 2b is estimated small zones of water supply are considered. These are zones where up to 1 000 m³ of water for twenty-hours is distributed. They include 2 points for monitoring on the water network in the villages Zhelyava and Klisura. The long-term level ПК2б is 98% and presents the ratio between the number of analysis of the potable water quality in small zones of water supply for the reporting year which correspond to the requirements of Ordinance № 9/ 16.03.2001 and the total number of analysis of potable water quality in small zones of water supply with excluded analysis which show deviations permitted by the ordinance on art.135, p.3 from the Water Act.

The variables (iD51b и D51b), forming this indicator, present the sum of the laboratory analysis by different quality indicators of the water in small zones of water supply defined in Appendix № 1 of Ordinance № 9/ 16.03.2001 for the quality of water used for potable needs where are included indicators with indicative meaning, physicochemical indicators and microbiological indicators. The variable iD51b gives the number of laboratory analysis on indicators for the quality of water corresponding to the legal requirements. The variable D51b gives the total number of laboratory analysis for the same indicators for the quality of water required by Ordinance № 9/ 16.03.2001.

The number of samples taken as well as the number of laboratory analysis are legally defined and coordinated with the Sofia Regional Health Inspectorate. The frequency of sample taking and analysis for each point for monitoring in Sofia and the region are defined as it depends on the water volumes supplied to the respective area in accordance with the requirements of Ordinance № 9.

2.4. MONITROING ON THE QUALITY OF THE POTABLE WATER

When the KPI 2c is estimated, the four zones of water supply are considered with the points for monitoring on the water network covered by them (Water source Iskar Dam, Water source Beli Iskar Dam, Vladayska river, Water catchment Klisura - Vurlo usoe). These four zones of water supply are additionally divided into the so called DMZ zones which are 29.The variables (iD98 и iD99), forming this KPI, present the performance of the monitoring program for sample-taking by zones for water supply.

Taking of samples for monitoring is carried out based on preliminary prepared annual program as per the requirements of Ordinance № 9/16.03.2001. The program for monitoring of the potable water is coordinated with the Sofia Regional Health Inspectorate (RHI) in accordance with the requirements of Ordinance № 9/16.03.2001. The points for sample-taking are defined together with the Sofia RHI and they are 78. They are divided into the 29 DMZ zones which are placed in the four zones of water supply. Every year Sofiyska Voda takes more than 2 000 *control* samples from the points for monitoring on the water network to the consumers and carries out more than 40 000 analysis on these samples. This number exceeds the minimum number of *control* samples required legally. Besides the obligatory monitoring on the potable water Sofiyska Voda performs additional monitoring on the quality of potable water supplied to the customers aiming to monitor the efficiency of the activities undertaken on the water network. The additional monitoring includes sample taking and laboratory analysis after emergency and planned water interruptions, control of the water supplied through alternative water supply (water tanks), as well as internal control when customer signals are registered.

The samples are taken under internationally accepted standards. The activity is carried out by trained specialists in accredited for the purpose laboratory of Sofiyska Voda.

The laboratory analysis of the samples is done based on accredited methods, accepted and approved by international standards and/ or internal laboratory methods. The developed and used methods are in complete conformity with the requirements of Ordinance № 9/16.03.2001, Appendix 3. The activity is carried out by the accredited laboratory of Sofiyska Voda under the standard БДС EN ISO/IEC 17025.

The Laboratory of Sofiyska Voda has developed Management System in conformity with the requirements of БДС EN ISO/IEC 17025, which regulates the control measures over the reliability and accuracy of the results from analysis. The

procedure for control covers internal control over the quality of the results from analysis (control cards, metrological checks, using of certified reference materials) and external control - participation in adjustment tests at international level.

The forecast level of the indicator KPI2c for the period 2017-2021 is 100% and the long-term level is 100%.

2.5. PROGRAM FOR IMPROVEMENT OF THE QUALITY OF POTABLE WATER

The quality of the potable water supplied to customers is impacted by a number of factors – securing the sanitary-restricted areas of the water sources (SRAs), the quality of the raw water from them, the condition of the impounding structures, the technical condition of the treatment facilities for primary and secondary treatment (potable water treatment plants and chlorination stations and points), the condition of the distribution water supply network, the level of consumption of potable water etc. In view of keeping the achieved up to that moment levels of compliance with the KPIs for potable water, for implementation are envisaged investment projects as well as operational measures in accordance with the description below in it. 2.5. A significant factor for the timely ascertaining of potential risks and /or risk that occurred related to the quality of potable water is the implementation of constant reliable and accurate monitoring.

Operational measures:

Factor	Measures	Frequency
1. Security of the Sanitary Restricted Areas (SRA's)	1.1. Maintenance of the fences of the SRA's 1.2. Regular patrolling and visual inspection of the SRA's 1.3. Monitoring of the quality of raw water after water abstraction	1.1. Over the entire 5-year period depending on the necessity 1.2. Over the entire 5-year period 1.3. On a daily basis for the water at the inlet of the PWTPs by laboratory tests in real time – measuring the indicators of the water at the inlet of the PWTP
2. „Dam aging" – natural changes in the quality of raw water; change in the category	Monitoring and analysis of the need for change of the doses and/or the type of the reagents for treatment of water for drinking purposes	Yearly based on a program for monitoring of water sources
3. Corrosion of the water mains § decrease of the speed and worsening of the refreshing of	3.1. Network flushing	3.1.1. After operational activities in the water supply network; 3.1.2. Regular flushing of sections from the network, known for increased risk of impact on the quality of

water as result of decreased water volumes		potable water quality;
	3.2. Correction of the levels of secondary disinfection	3.2.1. In case of ascertained increased spending of the residual disinfectant in the network or shorter time of using up
		3.2.2. In case of considerable fluctuations in water volumes and/or risk of occurrence of deviations in the microbiological characteristics of potable water
	3.3. Daily monitoring by laboratory tests	3.3. Frequency corresponding to the program, approved by the Regional Health Inspectorate – Sofia
	3.4. Use of the strategic model for assessment of the risk of worsening the quality of potable water at decreased speed in the water mains (*Appendix 2* – map with the speed of water in the water supply network)	
4. Technical condition of the treatment facilities	4.3. Cleaning and disinfection of the water chambers of the service reservoirs	4.1. Annually in compliance with the operational program for the activity
	4.4. Repair and rehabilitation of the sand filters in PWTP	4.2. Annually for some of the filter cells over the entire period of the BP
	4.5. Replacement of the sand in the sand filters and improvement of the filtration capacity	4.3. Annually for some of the sand filters depending on the technological characteristics over the entire period of the BP

Measures related to the implementation of investment projects

In order to guarantee a normal, efficient and continuous work of the two main potable water treatment plants (Bistritsa and Pancharevo PWTPs) a number of capital projects are envisaged, which are included in the proposed by SV investment program.

The investment projects include rehabilitation of main and supporting buildings and capital repairs of treatment facilities with their adjacent channels, pipelines and fittings on the route of water (including inlet distribution chambers, clarifiers, filters, outgoing distribution chambers and facilities for accumulation and treatment of

process water). The implementation of the stated projects will lead to the following benefits:

- ensuring continuity of water supply by flawless continuous operation of the treatment plants;
- Reduction of water losses on the territory of PWTP due to facilities with poor technical condition, worn out fixtures, ineffective machines and technological equipment;
- Increase of the efficiency of control of the treatment processes and maintenance of high levels of compliance regarding potable water quality

More significant projects envisaged for implementation in the two main PWTPs are:

Over the period 2017 - 2021 will be executed gradual rehabilitation of the filter cells in Bistritsa PWTP and replacements of the accessories, stop and regulating valves. The aim of the project is to improve the quality of the treatment of water by means of filtration process. The increased efficiency of treatment after completion of the rehabilitation will allow optimization of the consumption of the volumes of used reagents and will provide precondition for more efficient disinfection at the outlet of PWTP;

In 2017 on the grounds of the technical project is planned the construction of a water absorbing system in the Filter House of Bistritsa PWTP. The implementation of this project will lead to reduction of the great humidity in the air and the aggressive effect on the bearing structure of the roof and the metal surfaces such as parapets, metal windows, etc.

In the period 2017-2021 a gradual capital repair activity will take place on damaged buildings PWTP Bistritsa in order to improve their functionality and durability and making them compliant with the effective legal and normative requirements.

Over the period 2019-2021 on the grounds of a technical project is envisaged to separate two chambers in the stilling basin of the inlet facility of Bistritsa PWTP. The objective of the project is to separate two interchangeable stilling chambers, which can work completely independently and in such a way flexibility in the operation of the facility and continuous work of the station will be reached.

In the period 2017-2021 is planned gradual rehabilitation and modernization of Pancharevo PWTP. After almost 50 years of operation the facilities and the buildings are very damaged and the performed partial repair activities have not improved their operational and technical condition.

Their rehabilitation will contribute to optimization of the respective production processes and will respectively influence on the compliance of the indicator for quality 2 (‘Quality of the potable water’) and also for reduction of losses (including purely physical and those for technological needs) and the costs for electric power.

In the period 2018 – 2021 is envisaged the gradual optimization of the backwash of the sand filters in Bistritsa PWTP and Pancharevo PWTP including purchasing of new processing devices (online monitors). The implementation of the

project will reduce the number of the flushing of the sand filters and more efficient use of the thickness of the sand layer respectively the operational costs will be reduced.

For more efficient disinfection of the outflowing water from the two PWTPs, optimization of the consumption of chlorine and the stored chlorine in the base warehouses, delivery and installation of reactors of UV-disinfection of the outflowing water from PWTP is envisaged. The disinfection with ultraviolet radiation is the only method for treatment guaranteeing annihilation of the microbiological pollutants in a way which excludes their replication and restoring in the water distribution network.

In the dispersed along the entire concession area chlorination stations through which initial and follow-up (secondary) chlorination is performed, in the period 2017-2021 gradual rehabilitation activities are also envisaged which include capital repair activities of buildings and premises, replacement of depreciated technological equipment for chlorination of water and for disinfection of released chlorine in the air of the technological premises of some of the chlorination stations and points. The implementation of the project will contribute to optimization of the respective production processes and respectively of the indicators of the quality of the potable water.

It is envisaged to improve the effectiveness of the disinfection (decontamination) of water along the route of Kremikovski water main and the end sections of the connections from ring III. The necessary disinfection of potable water is directly connected to the KPIs.

In compliance with the activity for control of the indicators of potable water, the LTC of SV has resource in terms of instrumental apparatus and ancillary laboratory instruments. For the purpose of continuous exertion of this control it is necessary the worn laboratory equipment to be replaced by a new one. In order to develop new methods and to optimize existing ones included in the regulatory documents for potable water (Ordinance No 9/16.03.2001) it is necessary to purchase new instruments and new ancillary laboratory equipment. The provision of new and reliable apparatus will guarantee the constant laboratory control over the indicators of potable water.

In view of meeting the achieved until the moment levels of compliance with the KPI for the quality of potable and wastewater, as well as the implementation of the standards for quality of the industrial wastewater entering for treatment investment projects are envisaged.

Over the period 2017-2018 and 2020-2021, it is envisaged to purchase and replace main laboratory equipment for analysis of organic pollutants in potable water, required in Ordinance No 9/ 16.03.2001 on the quality of potable water, Ordinance No. 12 / 2002 for the requirements for the quality of surface water for potable and domestic purposes, Ordinance No 1 dated 2007 for survey, use and protection of groundwater. It will ensure the continuous control over the major pollutants in the water supplied for drinking by the population. The replacement of the equipment will

provide the keeping of the metrological tracking of the results and maintenance of the accreditation of the laboratory.

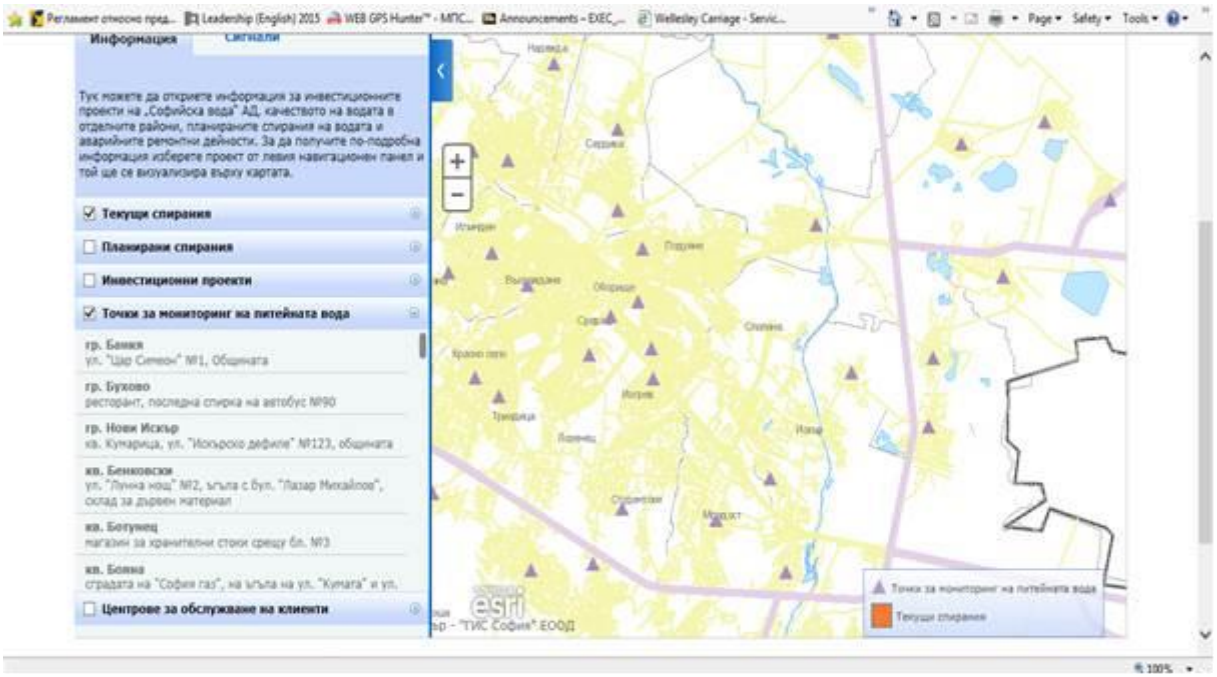
For the purpose of cutting the time for analysis in the control of microbiological indicators monitored in potable water, during this period the purchase of an analyzer for real-time determination of the microbiological indicators has been envisaged. This will lead to a faster and a timely evaluation of the efficiency of potable water disinfection.

In the period 2019 – 2020 the upgrading of the laboratory management software with a newer version has been envisaged. The expectations are after the implementation of new software developments to cut the time for reporting data from analyses; automatic assessment of the level of compliance; the possibility for real-time reporting of deviations of the quality. These improvements will be reflected into the reaction time in operational and corrective activities on the water supply network, the servicing reservoirs and the potable water and wastewater treatment plants.

Over the period 2019-2021 it is planned to replace the worn instruments in order to ensure constant control of the indicators of potable and surface water, wastewater and sludge

Over the period 2017-2021 gradual replacement is planned of the small laboratory equipment and ancillary laboratory equipment used for the analyses of potable and surface water, groundwater, wastewater and sludge from WWTP. The ancillary equipment includes laboratory thermostats, furnaces dryers, sampling devices, refrigerators, distillers etc. which will ensure the necessary conditions for the analyses and compliance with the requirements set in the used methods. On the other hand the ancillary equipment will ensure safe work environment in the laboratory and safe storage of the used reagents and chemicals for analysis. The small laboratory equipment includes measuring instruments for field and daily analyses. Its replacement is intended to secure the field tests made with the water to be supplied to households, without which the analyses cannot be made. The equipment used for the everyday analyses is depreciated most quickly and it order to have constant control of these indicators, the analyses should be made with devices which are in metrological validity and with the required accuracy of the measurement.

Information for the result from the conducted monitoring of the quality of potable water is accessible for the customers on the website of the company in the section „*Information center“:*



In addition to all envisaged measures relating to maintaining the potable water quality, during the regulatory period the company plans on applying an **innovative** and proactive approach with regard to the management of potable water quality. The approach consists of the real time monitoring of key characteristics of the potable water quality on its way between the places of secondary disinfection and the valves at the customers' ends. The construction of a network for real time monitoring of the quality of potable water in the distribution water supply network is envisaged. The first stage of this project will be completed in the period 2017 – 2021. The expectations are for cutting the reaction time in case of fluctuations in the quality of potable water (for ex. as a result of staling of the water due to temporary changes in the water supply schemes etc.), as well as for possibility for real time evaluation of the necessity for completion of preventive measures (for inst. inclusion of a part of the network into the program for periodic flushing/refreshing of the water).

2.6 ANALYSIS OF THE CONTINUOITY OF THE WATER SUPPLY

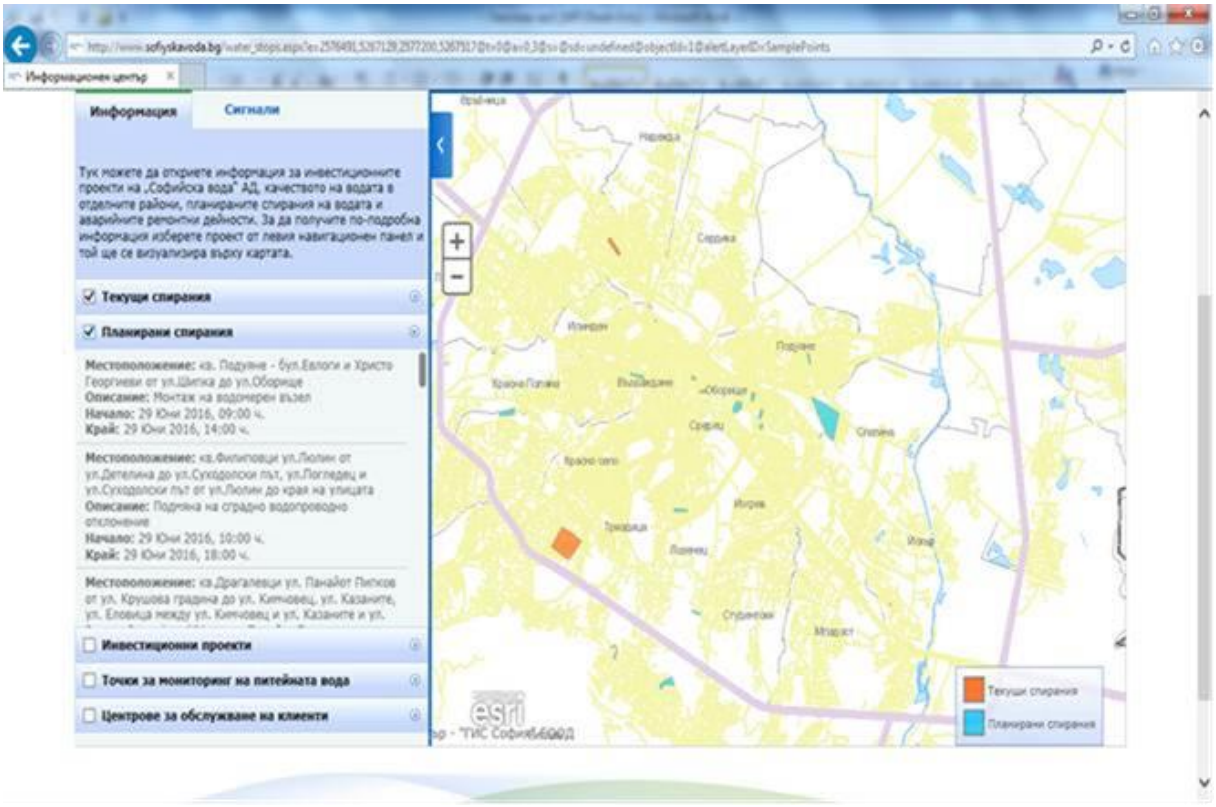
The continuity of water supply for the individual customers is impacted by the following factors:

- Local short water supply interruptions as result of implemented emergency and planned repairs of impounding structures, pumping stations, service reservoir and sections from the water distribution network;
- Repair of the hydrophore installations, which impact water supply continuity for customers who live in the higher floors of the multi-storey residential buildings;

- Limited water volumes at some of the water sources from which water abstraction is carried out for domestic and drinking purposes (Klisura village).

The planned water supply interruptions are accompanied by preliminary notification of the affected customers, including by SMS – notification (after free of charge registration) valid as of the second half-year of 2014. In case of duration of the repair exceeding 12 hours alternative water supply is ensured by water tanks.
Information for each water supply interruption is published on the website of the company in view of informing the affected customers.

Information about any interruption in the water supply is published on the company's website with a view to informing affected customers.



The expectations of the company are the zones, affected by the water supply interruption to be reduced thanks to the implementation of measures for replacement and installation of stop valves and improvement of the management of the water supply network. The results are demonstrated in improvement of the KPI *Water supply continuity,* despite the fact that the achieved levels even at the base 2015 were better than the long-term levels for the KPI.

2.7. ANALISIS OF COMMON WATER LOSSES

Under the **Methodology for determining the admissible water losses in the water systems, issued by the MRDPW on 01.06.2006,** the balance in the water supply system is divided between the following categories:

- ***Total water volume at the system inlet Q4,*** divided into:
  - *Total authorized consumption QI*;
  - *Total water losses Q6;*

- ***The total authorized consumption Q5*** includes:
  - ***Sold billed water Q3****,* including
    - *Billed metered water consumption Q3.1*
    - *Billed unmetered water consumption Q3.2*;
  - ***Supplied unbilled water Q3A****,* including
    - *Unbilled metered water consumption Q3A.1*
    - *Unbilled unmetered water consumption Q3A.2;*

- ***Total water losses Q6*** including:
  - ***Commercial water losses Q8****,* including
    - *Unauthorized consumption Q8.1*
    - *Metering inaccuracy Q8.2*;
  - ***Actual water losses Q7****,* including
    - *Leaks from raw water mains and treatment losses Q7.1*
    - *Leaks from the distribution system Q7.2*;
    - *Leaks and overflow of reservoirs Q7*.3;
    - *Leaks from water service connections Q7*.4

- ***Non-revenue water (unaccounted-for water) Q9*** including:
    - *Supplied unbilled water Q3A,*
    - *Commercial water losses Q8*
    - *Actual water losses Q7*

The balance of the main system WS calculated in compliance with the methodology is given in the following table:

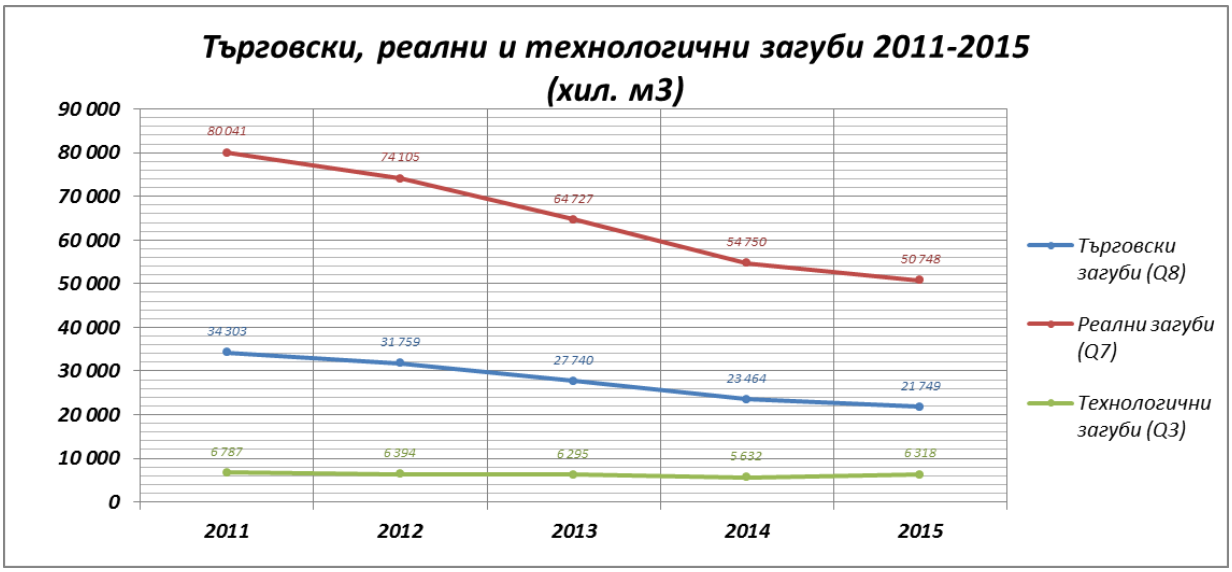
<table>
<tr><td rowspan="8">Общо водно количество на входа на системата (Q4)
158 249 702</td><td rowspan="3">Обща законна консумация (Q5)
85 752 164</td><td rowspan="2">Продадена фактурирана вода (Q3)
79 434 122</td><td>Фактурирана измерена консумация на вода (Q3.1)
78 624 151</td><td rowspan="2">Фактурирана и носеща приходи вода (Q3)
79 434 122</td></tr>
<tr><td>Фактурирана неизмерена консумация на вода (Q3.2)
809 971</td></tr>
<tr><td rowspan="2">Продадена нефактурирана вода (Q3A)
6 318 042</td><td>Нефактурирана измерена консумация на вода (Q3A.1)
2 848 348</td><td rowspan="6">Неносеща приходи вода (неотчетени водни количества) (Q9)
78 815 580</td></tr>
<tr><td>Нефактурирана неизмерена консумация на вода (Q3A.2)
3 469 694</td></tr>
<tr><td rowspan="5">Общи загуби на вода (Q6)
72 497 538</td><td rowspan="2">Търговски загуби на вода (Q8)
21 749 261</td><td>Незаконно ползване (Q8.1)
17 696 558</td></tr>
<tr><td>Неточност при измерване (Q8.2)
4 052 703</td></tr>
<tr><td rowspan="3">Реални загуби на вода (Q7)
50 748 277</td><td>Течове във водопроводите за сурова вода и загуби при пречистването им (Q7.1)
761 224</td></tr>
<tr><td>Течове в системата за пренос и разпределение (Q7.2)
32 161 720</td></tr>
<tr><td>Течове и препълване на резервоарите за съхранение (Q7.3)
507 483</td></tr>
<tr><td colspan="3"></td><td>Течове в сградните отклонения (Q7.4)
17 317 849</td></tr>
</table>

Balance of the main WS Sofia for 2015

The accepted by Sofiyska Voda JSC distribution up to date between categories Q7 (Real losses) and Q8 (Commercial losses) is in ratio 70% for Q7 to 30% for Q8 formed from category Q6 Total losses of water.

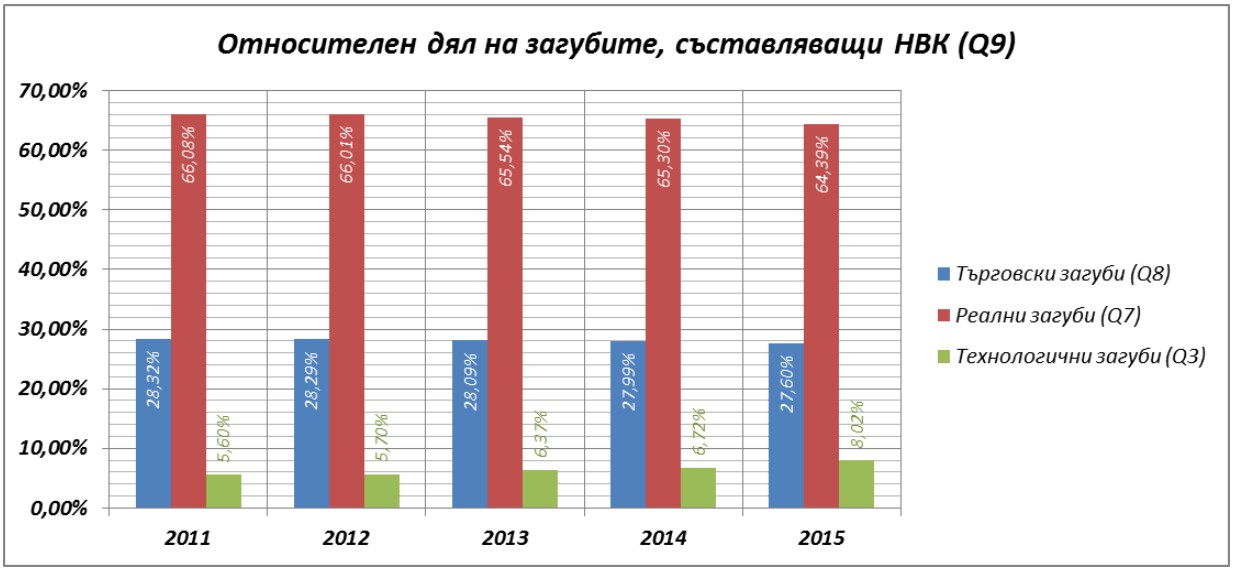
This ratio is calculated on the basis of data from the water meter zones with reporting the levels of minimum night flows, the assumed legal consumption (calculated on base assumed number of occupants in a given zone * 2.43 liters/hour/person, with reporting of big customers and the different parameters of the individual water meter zones.

In the graph below the levels of the real, commercial and technological losses for the period 2011-2015 are visualized.



In view of confirmation of the ratio between Commercial losses (Q8) and real losses (Q7), Sofiyska Voda JSC plans to perform in 2017 a detailed survey and analysis of the consumption and the intentions of the company are to attract the University of Architecture, Civil Engineering and Geodesy as a partner in the survey. The data from the survey will give an opportunity not only to confirm or change the ratio between the commercial and real losses but also to update the data for consumption per capita as well as of the different types of customers.

The distribution of the percentage ratio of the three categories of losses – commercial, real and technological, the share of the Non-revenue water (Q9) is shown the graph below:



2.7.1. Analysis of commercial water losses (Q8)

The commercial losses related to the measuring of water consumption are due mainly to:

- unregistered, unauthorized water consumption;
- not measured water consumption – not measured by a revenue meter;
- uncovered water consumption – not covered by a metering device..

Main reasons for commercial losses

Unregistered, unauthorized water consumption:

- **Sites illegally connected to the water supply network** – these are sites which performed actual connection to the network without the documents required under SDA, Ordinance 4/ 2004 and other legislative documents. In actual conditions, these cases are very hard to identify and prove by the WSS Operator.
- **Non-regulated water use from sites which are customers of the WSS Operator** – various practices, including non-regulated connections from the water service connection upstream the revenue meter, additional non-regulated supplies to the site from the water supply network without revenue meters, and various other practices. In actual conditions, these cases are very hard to identify and prove by the WSS Operator.
- **Non-regulated water use from compact Romani residential areas** – illegal buildings which gradually expand and result in the formation of ghettos. The WSS Operator has limited rights in these cases, and almost no possibilities for reaction and/ or interaction

In all these cases, the WSS Operators have very limited possibilities for reaction. The access and possibilities for making non-regulated connections to the water supply network is sufficiently easy, and there are technical means for establishing connections under pressure – which the Operator has no possibility to control. The proof of an illegal/ non-regulated connection to the water supply network is difficult; in many cases the sites acquire documents legalizing the construction sites without concluded agreements for connection with the WSS Operator.

The legal solution of such cases by the WSS Operator is the imposing of fines and cut-offs. In actual conditions however the cut-off is often not a solution, because the actual disconnection requires pavement breakage activities (which is a serious expense for the Operator), and the possibilities for subsequent connection to the water supply network are extremely easy, especially in case of an already existing excavation – covered with a backfill. In many cases the disconnection is even impossible, since the properties are inhabited by people.

Unmetered, uncovered water consumption:

- **Lack of installed revenue meter on the water service connection** – the billing is done in accordance to the legislation;
- **Presence of an old revenue meter which is metrologically invalid** – that is, it meters water volumes beyond the legislatively established error levels
- **Inaccurately dimensioned revenue meter on the water service connection** – demonstrates more errors in the water volumes metered in the upper sensitivity level (Q max) or lower sensitivity level (Q min) of the water meter as compared to the site's consumption. Particularly problematic are the cases in which the water service connection has been dimensioned for domestic water consumption and firefighting needs. The second element results in a significant increase of the connection's diameter as compared to water consumption under normal conditions;
- **Location of the metering node** – in many cases the location of the metering nodes does not meet the requirements of Ordinance 4/2004 (metering shaft located up to 2 m away from the property's boundary, or a metering node located up to 5 meters from the property's boundary). Since the obligation for the construction, maintenance or relocation of the metering shaft belongs to the property's owner but no sanctions are envisaged in case of non-conformity, the WSS Operator has limited possibilities for control and impact;
- **Failure to provide access for meter reading on the part of the properties'** owners/ users – under the legislation, access should be provided for an actual reading at least once per year. In fact, the WSS Operator has limited possibilities for control and the provision of access to the revenue meters;
- **Other cases –** thefts, damages, meter manipulations;
- **Non-regulated water use in condominiums** – inside the apartments, connection of customers upstream the individual meters (for instance, the connection of washing machines, dishwashers and other appliances upstream the meters). In case of a revenue meter on the water service connection of the building, such consumption leads to high common needs. In case of absence of a revenue meter this is uncovered consumption.
- **Buildings – condominium supplied by pumping-hydrophore installations** – in a number of cases non-regulated connections (bypasses) between low and high zone, often on the inside installations there are non-functioning stop valves and reversing valves which leads to transfer of waters between the zones leading to both incorrect reading and inefficient work of the pumping hydrophore station.
- **Water consumption in site territories** – territories with predominantly commercial/ industrial customers; former/ current agricultural sites; territories of formal factories; parks; graveyard territories; hospital

complexes; as well as other territories which have no residential construction.

On such territories there are currently existing and/ or former site WSS networks – which are not public networks, have not been officially handed over for operation and maintenance to the WSS Operator, lack documents regarding their operation and/ or tolerance proclaiming, do not pass through the routes of public municipal and/ or state streets and only service buildings in the so-called site territories

Covering the entire consumption in these territories is very difficult due to the obscure status of the territories and of the networks and the absence of clear responsibility in regard to the network management.

- **Inside issues in regard to the WSS operator** – errors in readings, errors in invoicing, making corrections to already invoiced readings, etc.

Actions and measures:

Sofiyska Voda JSC focuses on the following activities over the past 2015 to solve the commercial losses issues and inaccurate water consumption reading:

- **<u>Surveying territories defined as site networks</u>**

There are two objectives:

- To complete the technical survey of preliminarily defined territories as site networks;
- To check previous surveys where internal losses were not billed – finding the reasons.

Expected results:

- clearing all ambiguities concerning the existing networks and the consumption of sites to which water is supplied in these territories;
- possible measurement of potential losses;
- possible billing of measured losses;
- Entering data on water service connections, customers, water meters in the geographic information system.

- **<u>Survey of district metering zones (DMA);</u>**

Surveying a DMA includes:

- Selecting an area;
- Extracting all addresses, buildings about which in geographic information system (internal software applications) the following information is not available:
  - customer;
  - water service connection
  - revenue meter;
  - accurate address.

- The remaining addresses are checked on site in order to find whether the following exist:
  - Water supply;
  - customer;
  - consumption;
- In case such exist, they are entered in geographic information system or submitted to the respective teams:
  - illegal connections;
  - replacement of water meters;
  - Control room

- **identification of condominium blocks without an account for revenue meter**

Process:

- checking addresses of blocks with individual accounts where there is no account for revenue meter (no revenue meter, either);
- clarifying the water supply;
- installing water meters;
- Entering in the system and distributing common consumption.

Expected results:
Billing common consumption after installing the revenue meter for the block. The volume of common needs is on average 9 – 12% of the consumption read in a condominium

- **Renewing the revenue meters**

Possible uncovered consumption due to the following:

- old device resulting in decreased sensitivity, especially with low consumption;
- non-functioning devices
- Water meters of incorrect size

- **Control on the condition of big customers:**

Site survey in case of:

- Dramatic changes or anomalies in consumption – connections, water meters, network;
- Systematic checks and control over the connections, supplies and metering devices

- **Suburban part of the Concession Area**

The mass inspections at settlements in the suburban part of the Concession Area, mainly aimed at visiting addresses for which:

- there is no actual reading of meters for more than 1 year;
- available information that the property is not inhabited and water is not consumed – closed services;

- lack or incorrect addresses;
- Lack or insufficient information about customers, consumption, and water meters.

Expected results:

- update of information about customers, addresses, water meters;
- specifying the status of customers;
- providing access to read or replace meters;
- billing the read consumption;
- Entering the data on water service connections, customers, water meters in geographic information system.

- **Survey of addresses with a revenue meter with closed services, i.e. the consumption is not metered and not billed**

Services are closed in the following cases:

- Destroyed property;
- Uninhabited property;
- Customer's request due to seasonal residence.

Possible problems and risks of commercial losses:

- The customers may not inform that the property is inhabited and has consumption – with or without a purpose;
- Straightforward water theft, meter manipulation;
- Meter blocking or expiry of the metrological validity, which can afterwards result in no metering or inaccurate metering.

- **Survey of addresses which have a water service connection geocoded in the geographic information system of the company, but are without a geocoded revenue meter.**
- **Survey of customers whose consumption is not measured and billed with revenue meter;**
- **Survey of the water supply network of parks and city gardens within the Municipality of Sofia.**

We believe that the measures that the Company has taken in order to reduce commercial losses will result in their decrease over the new regulatory period. It needs to be pointed out that the support of the MoS and Energy and Water Regulatory Commission is needed so that the above described measures may be effective and deliver the expected results

2.7.2 Analysis of the real losses of water (Q7)

The category Real losses of water (or physical losses of water) is formed from the leaks along the water supply network occurring on the impounding and distribution water mains, service connections and reservoirs. The calculated share of the

physical losses from the total losses by the Company amounts to 70%, or 50.7 million m3 for 2015 (Total losses = 72.5 million m3) on average of 4.2 million m3/month, or on average of 139 K m3/day.

The level of physical losses in the water main network on the territory of Municipality of Sofia is determined by the following factors:

As was mentioned above the water main network of Sofia is designed and constructed with working pressure of 8 Bar (80 meters of water column), however, there are a number of territories where the pressure exceeds 10 and more atmospheres. The high pressure has a strong unfavorable effect on the water main network by creating preconditions for occurrence of frequent failures with high flow of the leaking water volumes resulting from the occurred failures.

As was mentioned big part of the water main network of Municipality of Sofia is built out of poor quality materials - mostly asbestos cement and steel. The materials as well as the quality of the construction of the water mains, placed mostly between the middle and the end of the last century, lead to the frequent occurrence of failures on these water mains, their fast amortization and brief service life which in the general case has expired.

Also the water mains, built at the expense of the customers, cause a serious problem – usually they are built with very insufficient diameters from today's point of view, they are strongly amortized, have a decreased DN which causes significant problems of hydraulic nature – loss of pressure, incapacity for providing the necessary flow, preconditions for increasing the pressure due to the low conductivity of the water main, occurrence of multiple number of failures due to decreased conductivity, etc. Meanwhile, these water mains are usually placed at a very small depth and due to this they are influenced by the weather conditions and the road traffic.

An increasingly serious problem for the normal provision of the water supply of Sofia is the condition of the main impounding and strategic water mains – these were built more than 40 years ago and are in already unsatisfactory operational condition. The failures along these facilities lead to intense leaks which due to the specifics of the routes of the water mains are difficult to locate and to access. The repair of failures along these water mains, when interruption of the water supply is necessary, leads to affecting big territories for a continuous period of time of 12-15 hours, significant changes in the scheme of water supply and application of alternative schemes which leads to higher stress on the entire network, affected by the changes. The failures on major water mains are repaired in a very difficult way and their reconstruction is very expensive and complex for realization without affecting the normal service to the customers. The presence of embankments along the routes of the impounding water mains continues to be an additional problem and despite the efforts of the company the issue has not been resolved.

Despite the absence of maintenance of the network in the past, which has led to the presence of very small number of functioning stop valves, with which to manage the

network adequately, during the last years Sofiyska Voda JSC managed to implement result-oriented program for replacement of the non-functioning ones and installation of new stop valves. During the surveys of the network, even though less frequently, existing stop valves continue to be detected under the road surface, major part of which are in semi-closed or closed state which leads to the occurrence of issues and worsening of the hydraulic parameters of the network. The presence of sufficient number of stop valves and other fittings – hydrants, air valves and drainage valves provide opportunity for a more flexible management of the network. Significant decrease of the zones, affected by interruption of the water supply for repairing of failures and planned activities as well as opportunity for implementation of alternative schemes of water supply.

The effect should be noted of the replacement of sections of water mains on the remaining part of the not replaced network - when a strongly amortized section with high level of failures and multiple existing leaks has been replaced, this usually leads to an increase of the pressure in the water main and the entire zone which leads to an increase of the level of failures on the water main and the network, and/or the connections with the remaining water mains which remain not replaced. In order to achieve a long-term and lasting effect, usually it is necessary that the entire part of the water main network of a given zone has to be replaced and the efforts of the Company during the last years have been targeted in this direction.

In a number of cases the leaks from the water main network do not occur on the surface but leak into the sewerage and heat supply network, existing cable routes and sewers or through the soil to existing undersurface waters. Detection of these leaks is strongly impeded by a number of factors among which is the absence of enough contact points along the network (stop valves, fire hydrants, manholes and others). In the process of repairing of failures, most frequently sections of the water mains with polyethylene pipes are replaced and, consequently, performance of activities for tracing the steel pipes and correlation of leaks is impeded.

The main indicator for high level of the real losses is minimum night flow – that is, the supplied water volumes in the 24-hour period with minimal consumption. Since 2014 Sofiyska Voda has started long-term program from detailed survey of DMA zones with high minimum night flow and the achieved results so far have had an effect on the entire balance of the system.

The main activities leading to decreasing of the real losses are:
- pressure management;
- active leakage control;
- replacement and rehabilitation of the existing water mains;
- decreasing the reaction time in situations of occurrence and detection of leaks;

Detailed information for each one of them in the respective sections of this Business plan is given.

2.7.3. Analysis of the supplied non-billed water (Q3A)

According to Methodology for determining the allowable water losses in the water supply systems issued by the Ministry of Environment and Civil Works dated 01.06.2006, art. 27 (2):

- Item 4 non billed supplied water(Q_{3A}) – for fire safety, technological needs and others ;
- Item 6 total lawful consumption (Q_5) – annual volume of supplied and non-measured water used by the customers; the unmeasured water volume includes costs for fire safety needs, flushing of water mains, technological needs of the treatment plants and for other normatively justified needs;

According to Appendix No. 4 under art. 28. Para. 2 order for determining the balance of water volumes in m3 on annual basis:

Category Q3A Supplied non-billed water includes the following sub-categories:

- Q3A.1: Unbilled measured water consumption
- Q3A.2: Unbilled unmeasured water consumption

According to the assumptions of the company:

- **Category Q3A.1 Unbilled measured water consumption** includes the measured consumption for technological needs of the treatment stations – *PWTP Bistritsa, PWTP Pancharevo and WWTP Kubratovo*;

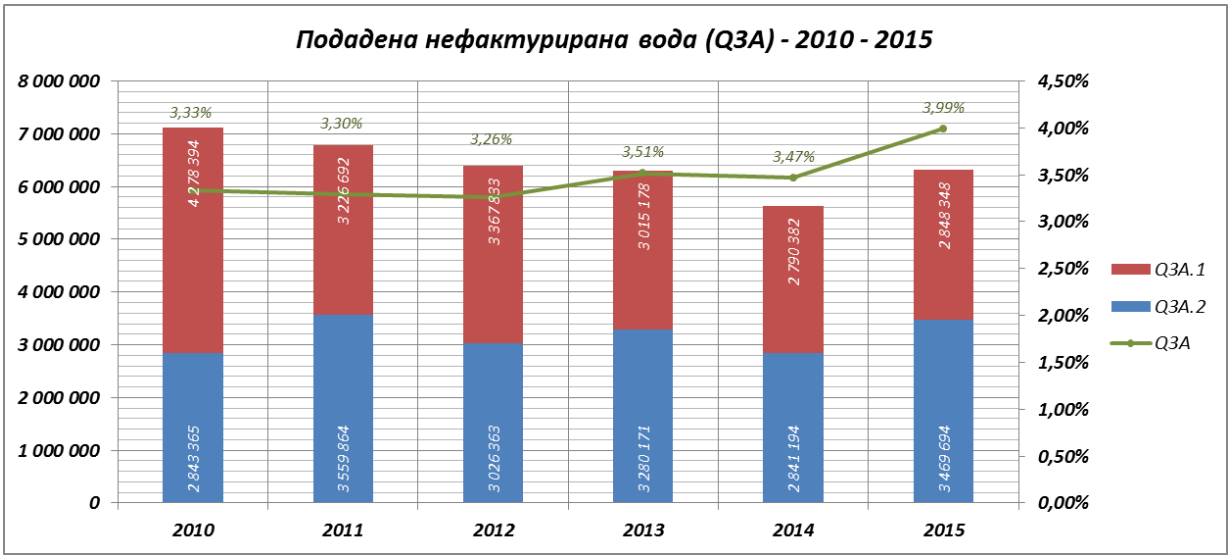
- **Category Q3A.2: Unbilled unmeasured water consumption** includes analytically calculated consumption in draining or flushing of water mains in interruptions of water supply, repairing of failures, performance of planned activities for maintenance and/or capital reconstructions. The category also includes consumption for draining and/or flushing of reservoirs in planned prevention activities, consumption for technological needs of Sewerage Network Management Department as well as consumption for fire safety needs

According to the introduced in 2010 normal, category Q3A.2 includes reporting of the following elements:

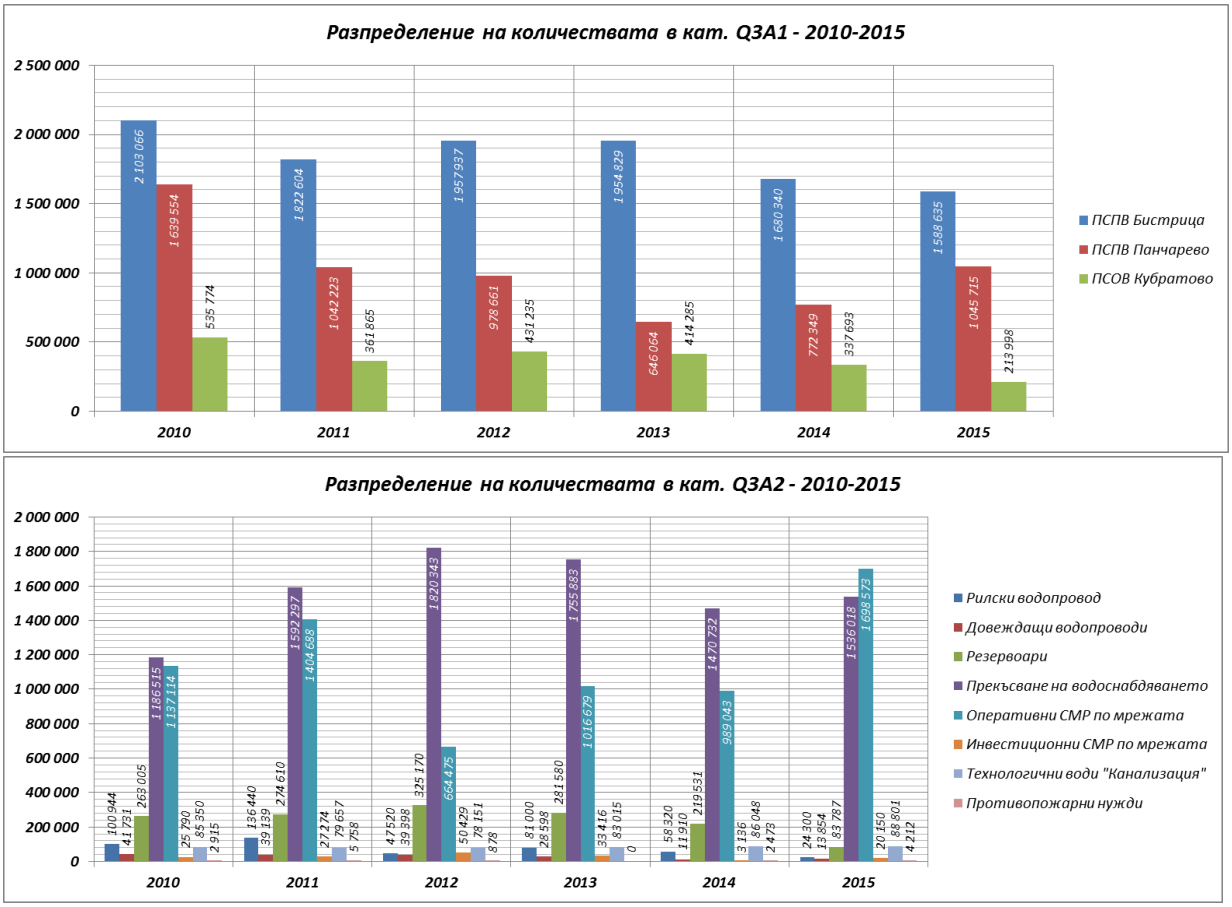
- Interruption/repairing of failures on Rilski water main;
- Interruption repairing of failures on impounding water mains ;
- Flushing/draining of pressure reducing reservoirs;
- Interruption of the water supply for repairing of failures on the distribution network;

- Flushing/insulation of sections during performance of civil works along the network from operational departments;
- Flushing/insulation of sections during performing of civil works along the network by capital projects ;
- Technological needs in the production activity of Network Management Department;
- Fire safety needs (according to data of Chief Directorate Fire Safety and Civil Protection).

The data for the period 2010-2015 since the current system for calculation of the technological needs has been implemented show that the volumes of category Q3A vary between 3.33% - 3.99% of the supplied water at the inlet system (category Q4) which is in complete compliance with the global technological requirements (up to 4% from Q4).



The tendency for increasing of the water for technological needs during the last three years makes an impression. In 2015 the value of the indicator has reached the practically approved normal of 4% of the volumes at the inlet of the system and the increase is mostly due to the increase of the category Q3A.2.



In view of the resized network of the city of Sofia and the decreasing consumption, in parallel with the decrease of the real losses, the velocity of water in the network with which the preconditions for occurrence of deviations in the water quality increase. Due to this reason, the flushing of the network after interruptions of the water supply, performing interventions in the network – planned and emergency, or consequently received customer signals will increase in time.

For 2015 the distribution of the volumes for technological needs by the different categories are as follows:

Позиции	*яну*	*фев*	*мар*	*апр*	*май*	*юни*	*юли*	*авг*	*сеп*	*окт*	*ное*	*дек*	*Общо*
	m³	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*	*m³*
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Q3A1 - нефактурирана измерена консумация на вода													
Собствени нужди на ПСПВ Бистрица	1 050	1 160	886	1 082	780	2 481	2 801	2 269	1 824	2 126	430	573	17 462
Промивни води ПСПВ "Бистрица"	99 627	101 757	124 457	140 591	122 844	111 061	140 649	121 031	96 098	122 717	146 761	243 580	1 571 173
Промивни води на ПСПВ Панчарево	39 898	61 549	97 516	157 181	151 465	111 327	59 681	81 249	62 387	64 827	56 497	102 138	1 045 715
Технологични води на СПСОВ Кубратово	27 331	20 232	22 895	23 488	15 392	13 137	15 900	16 173	11 855	10 434	17 450	19 711	213 998
Общо Q3A1													**2 848 348**
Q3A2 - нефактурирана неизмерена консумация на вода													
Рилски водопровод	0	4 860	0	0	0	0	0	0	0	19 440	0	0	24 300
Довеждащи водопроводи	2 623	2 419	2 678	0	0	0	0	0	0	864	2 592	2 678	13 854
Резервоари	250	500	1 120	24 125	2 603	8 493	17 153	6 280	14 400	863	8 000	0	83 787
Прекъсвания на водоснабдяването	61 888	80 157	65 287	119 811	134 823	151 959	188 356	161 589	161 589	143 179	136 239	131 141	1 536 018
СМР дейности по мрежата - аварийна дейност	94 380	170 165	51 300	68 595	155 986	342 055	107 940	76 986	200 531	136 330	92 506	201 800	1 698 573
СМР дейности по мрежата - инвестиционна дейност	0	0	2 124	2 276	615	925	1 345	1 181	4 580	681	2 817	3 605	20 150
Дейности по канализационната мрежа	6 335	6 221	6 727	7 020	6 758	5 873	9 169	8 908	8 373	7 763	7 387	8 267	88 801
Противопожарни нужди	460	135	250	206	329	182	600	727	600	144	388	191	4 212
Общо Q3A2													**3 469 694**
Q3A - общо подадена и нефактурирана вода													**6 318 042**

Due to the incapacity for reducing the strategic water mains and the main branches of the distribution network as well as due to the presence of dead-end water mains for which it is technologically impossible to provide water circulation, it may be assumed that in the next few years the supplied unbilled water Q3A will increase and will reach the approved limit or will exceed 4% of the supplied volumes at the inlet of the system.

2.7.4 Justification for calculation of the volumes of losses by categories

As was mentioned, the approved by Sofiyska Voda JSC distribution between category Q7 (Real losses) and Q8 (Commercial losses) is in ratio 70% for Q7 to 30% for Q8, formed from category Q6 Total water losses. This distribution of losses is generally accepted in the WSS operators in Europe and the observations show that it is valid also for Bulgaria. The envisaged for the next year survey and analysis of the consumption will confirm and will give reasons for change in this relation.

The category Commercial losses Q8 consist of three elements:

- not registered and not regulated use;
- errors due to inaccuracy of the water meters;
- errors in reading.

In the calculation of the losses resulting from errors due to inaccuracy of the water meters a value of 5% of the measured and billed consumption Q3.1 is accepted.

In the calculation of the losses resulting from errors in reading, a value of 15% of the measured and billed consumption Q3.1 is accepted

The category Real losses Q7 consists of 4 elements:

- Q7.1 - leaks from impounding water mains;
- Q7.2 - leaks from distribution water mains;
- Q7.3 - leaks from reservoirs for storing;
- Q7.4 – leaks from service connections;

The respective accepted values of Sofiyska Voda JSC in calculation of the water balance of the system are as follows:

- for Q7.1 – leaks from impounding water mains - 1.5% from the real losses Q7;
- for Q7.2 - leaks from distribution water mains - 65% of Q7-Q7.1-Q7.2
- for Q7.3 - leaks from reservoirs for storing - 0.5% from actual losses Q7;
- for Q7.4 - leaks from service connections - 35% of (Q7-Q7.1-Q7.2);

For the calculation of the technological losses Q3Aa justification item 2.7.3. was given.

2.8 ANALYSIS OF FAILURES ALONG THE WATER SUPPLY NETWORK BY SYSTEMS

For the construction of the existing water distribution network are used mainly pipes of cast iron, steel, incl. galvanized steel and asbestos cement. Below are the advantages and disadvantages of each material, as well as brief description of the ways of connecting the segments.

Cast iron pipes

Currently, there is a decreasing trend in the use of cast iron pipes in the water supply and sewerage systems. The main advantages of these pipes are their long life and the fact that they do not corrode. However, they have very thick walls, they are very rough and they are relatively complex to install. Cast iron pipes are also brittle, and the connections between them are not considered particularly reliable. Usually, the pipes are connected through joints, flanges and screw-joint connections. When joints are used, the sealing is through lead rods put between the joint and the pipe, and the remaining space is filled with molten lead or by rubber rings. The connection through flanges is usually upon connecting the pipes to a stop valve or fitting. Such a connection withstands higher pressure; however, it has lower elasticity as compared to the use of joints. A screw-joint connection is considered a better solution, as the inside of the joint has a thread where an externally-threaded ring is screwed, pressing a rubber gasket. This connection is considered more elastic than the connection through flanges and stronger than the one with joins

Steel pipes

Steel is among the materials with widest application for production of pipes of various purposes. Steel pipes are considered suitable for constriction of all types of pipelines. Their advantages are the very high strength, the possibility to produce pipes of great length, the strong connections and the relatively low roughness of the walls. The main disadvantage of the steel pipes is the fact they are not resistant to corrosion. In addition, they have considerably lower period of operation as compared to the pipes of polymeric materials. In case of high pressure, the pipes may rupture. Welding and threaded connections are used in order to connect the pipes upon installation

Galvanized pipes

The advantages of steel pipes apply for this type as well, plus higher corrosion resistance. Their disadvantages are usually the relatively fast wear of the coating and the hard installation, which is mainly by using thread. Welding is used rarely as zinc boils at high temperatures and hazardous gases are released

Asbestos cement pipes

These pipes are cheap, do not corrode and have relatively low roughness. However, asbestos cement pipes are considered carcinogenic. They are suitable mainly for

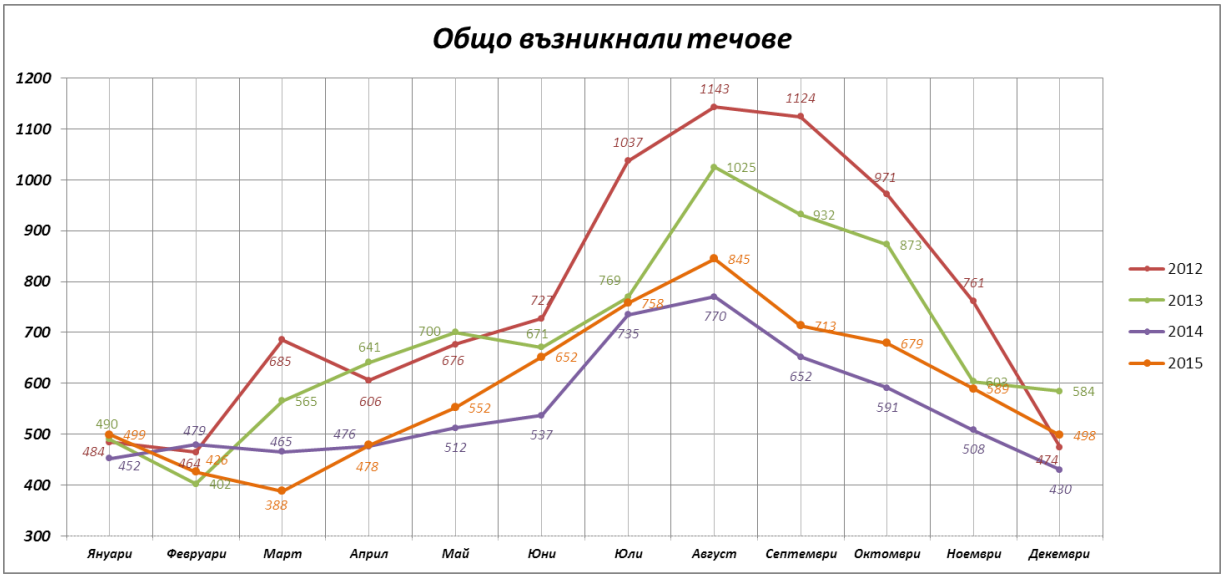
small diameters; they are brittle, with thick walls, and the connections between them are unreliable. They are usually connected through Simplex connection (asbestos cement joint), Gibault joint (cast iron joint) or flanged connection. With the Simplex connection, the 2 pipes whose ends have lower thickness are put opposite each other at a distance of about 5 mm. Rubber gaskets are put at the ends of the 2 pipes, and joint presses them to the pipes and prevents water from joint between them and the joint. Gibault joint is used for connecting 2 asbestos cement pipes or an asbestos cement pipe and a metal pipe. It consists of 2 flanges which press the rubber gaskets to a cast iron shell. The flanged connection is used for connecting an asbestos cement pipe to the stop fitting of a flange.

The failures along the water supply network could be separated conditionally into two main types:

1. Failures caused by fatigue of the material, corrosion, depreciation of the pipes and thus reduced strength of the walls of the pipe, which leads to failures releasing the stress. External impacts also include the impact of passing electric cables which boost the electrochemical corrosion of metal pipes in the area where the lines cross
2. Failures caused by additional stresses on the water mains, incl. sinking landmass, stresses of shear, bending, twisting, etc.

The first type of failure consists of a small puncture in the wall of the material, of small size, which is repaired by putting an emergency clamp. In a smaller part of the cases, there are longitudinal cracks in the pipes, and the water main is rehabilitated by replacing a section of the water main. This applies to almost all failures caused by additional stresses on the pipe because there forces do not act in a specific section of the pipe but on the entire affected segment.

Reinstatement of water supply or its gradual completion also impact failures especially for asbestos cement or highly worn out steel water mains. In almost all cases, the sharp reinstatement of water supply to full capacity leads to subsequent failures. The presence of air bottlenecks in the water mains formed at the interruption of the water supply also impact locally the increase of the pressure which in the general case also leads to the occurring of failures, Due to this reason the place at which prerequisites for retention of air are created are localized and measures are taken for their avoiding by installation of a suitable type of air release valve.



Total leaks

From the chart above is visible demonstrated seasonal appearance of failures – the peak in the number of failures is at the end of the summer/ start of the autumn. The reasons for it are a few and the most important are:

- - reduction of the consumption due to reduction in the number of the customers during the summer months and the relevant increase of the pressure;
- - detecting a number of hidden leaks due to detailed survey of areas with more frequent signals for low pressure and/or lack of water;
- - increased construction activity on the territory of the MoS and the related to it damages on water mains mostly due to heavy mechanization or excavation works;
- - Increased civil works over the summer months on behalf of SV which are related to water supply interruptions and additional pressure on water mains as result of the reasons above

It is important to point out that the chart reflects all assigned leaks – impounding water mains, distribution network, service connections, water meter nodes, fittings along the network due to which it does not correspond directly to the number of the failures that occur along the distribution network and the impounding structures.

The main impact on the reduction of the number of failures has the planned replacement of water mains and water service connections, their reactive replacement at the occurrence of failures, as well as the program for pressure management despite the fact that the impact on the latter in future is a lot less than in previous years. These activities continue to be among the priorities of the company and for the next regulatory period and the expected reduction in the number of failures along the distribution network and the impounding structures are presented in the relevant reports to this business plan

2.9 ANALYSIS OF THE PRESSURE IN THE WATER SUPPLY NETWORK BY SYSTEMS

SV maintains 4 water systems. In terms of territory 2 of them are in the serviced area and only one of is potable:

- **WS Beli Iskar** – there are no serviced end customers of SV. There is only one customer– „ViK" EOOD – Sofia – operator for the territory. SV operates only water sources and trunk sewers on this territory, as well as water meter shafts, which are revenue ones – points of water supply to ViK EOOD – Sofia. The pressure in the system meets only the requirements for normal work of strategic facilities, so that they operate with their design parameters. Pressure management in the area is not executed.
- **WS Bozhurishte** – also the only customer is ViK EOOD – Sofia. The points of supply are a few and water is supplied from WS Sofia. Pressure management is done only in one of the points – supply to Ravno Pole village– as the water abstraction is form Kremikovski water main with more than 10 Bar at the place of the connection. Despite the fact that the water main to Ravno Pole village is a private investment, in its part on the territory of MoS, it is a responsibility of SV and teams of the company maintain the PRV to reduce the risk of failures.
- **WS Non-potable** – the water source of the system is one (bent Pancharevo), which is at level of about 598 м above sea level at full lake. The lowest elevation of a customer in this system is in Ilientsi R.Q. – about 525 m above sea level. Its means static water pressure (the maximum possible) from 73 m or a little over 7 Bar. No pressure management has been executed in the system until now, as water is used for production needs. Due to the overall unsatisfactory operational condition of the system the company initiates measures for reduction of the pressure in most of the water main and the moment are discussed the options and the possible risks.
- **WS Sofia** – a main system of the company. The water supply system of Sofia is regulated by a Master Plan, which determines 7 water supply areas, which cover only the city. The displacement in this part of the serviced territory is almost 400 m – from 520m above sea level in Benkovski R.Q. to 900 meters above sea level at Simeonovo r.q. These 7 water supply areas are insufficient in number to be separated by height so that they meet the requirements of Ordinance 2 for maximum pressure of 0,6 MPa (≈ 6 Bar). For comparison purposes only – Simeonovo r.q. is in 7th water supply zone despite the fact that the displacement there is more than 250 m. In these residential quarters and mountain villages until a few years ago pressure management was limited to reduction of the supplied volumes by partial closing of the stop valves. The water supply areas in the highly urbanized part of the city are determined in the Master Plan to have maximum pressure of 8 Bar, and there are exceptions – Ivan Vazov R.Q., where the static water pressure exceeds 9 Bar.

It lead to the implementation of a large scale project for pressure management for reduction of the overall pressure in the network to acceptable for operation and building up levels. These activities were executed mainly in the period 2009-2015. Pressure management led to a lot of positive results – reduction of water losses, reduction of failures, detailed survey of the network as well as its better management.

2.10. PROGRAM FOR ZONING OF THE WATER SUPPLY NETWORK

The zoning of the water supply network was done only in the main WS Sofia. The zoning of the network, the so-called DMA program was implemented by determining border valves and by tests for zero pressure over the period 2002 – 2006. Due to lack of funds the measuring infrastructure was not equipped with devices. The devices were installed over the period 2008-2010 when the project was approved for funding

The zoning of the territory serviced by SV is executed at stages:

- SMA – Strategic Modeling Area –strategic zones for modeling. Determined on the basis of the water supply zones under the Master Plan – include the suburban area as well. They are specified on the basis of altitude, which depends on their water source. The zones are 4 covering the following territories:
    - Zone 1 –the northern suburban part of Sofia valley and the southern slopes of Stara Planina Mountain. The lowest part of the territory which at its passing to the mountain determines also the line of the pumping stations. Supplying are the lowest strategic water mains. This part is not included in the Master Plan as it is suburban.
    - Zone 2 –The low part of the compact city – its northern parts. The territory is mainly between 520 and 580 m above sea level. It is supplied by the low strategic reservoirs – Kolezha, Lozenets and Konyovitsa – from where the three rings also start – the main water supply arteries for the zone. It coincides to a large extent to 1st water supply zone under the Master Plan.
    - Zone 3 –. the high part of the compact city – its southern parts. The territory is closed mainly between 580 and 650 m above sea level. It is supplied by strategic reservoirs Iztok, Dragalevsti, Bakston, Moderno Predgradie and Lozhishte. It covers almost entirely 2nd and some of 3rd water supply zones under the Master Plan
    - Zone 4 – the highest southern parts of the territory – the settlements around the southern arch of the ring road, Vitoshka collar, Lulin Mountain, Lozenska Planina an Plana. These are the rest of the water supply zones in the Master Plan as well as the suburban urbanized mountain regions. All impounding structures of Sofia pass through it. The territory is supplied directly from them or by local reservoirs. The two strategic reservoirs in the area are Boyana and Malo Buchino. Due

to the high altitude a main water source for the territory is Rila water main.

- DMZ – District Meter Zone –zones for which there is no adopted translation in Bulgarian. They specify SMA areas - separate the different water sources in them. They are created mainly for the purposes of modeling – the zones are in general different systems with clear water supply and distribution – allow gradual modeling. DMZ are 29, 1 of them is rather fictitious – it includes the impounding structures and the strategic water mains.
- DMA – District Meter Area –water meter zones, The main objective of the activity is to achieve zoning meeting the criteria for DMA zones. Their number is still variable due to the ongoing development of the program but in the serviced territory there are about 200 zones with end customers and 85 zones with distributing and controlling structures – transit water mains, reservoirs, PWTPs etc.
- PMA – Pressure Management Area –areas for pressure management. Territories with reduced pressure in view of the reduction of the losses and easier operation – PRVs installed at the inlets. In the general case cover an entire DMA or smaller zones in it. But whereas the principal for creating of a DMA is the size of the network for PMAs the main criterion is the relief and the difference in the elevations. That is why there are cases when by one PRV a few DMAs are covered.
- Sub-DMA – specify the DMA zones, when necessary – small independent systems, big customers, different type of customers etc.

The zoning of the first 3 levels (SMA, DMZ and DMA) cover entirely the territory and each lower level specified the previous one, whereas PMA and sub-DMA zones are created only where necessary.

The continuous operations of the zones as well as the preparation of their balances show that the zoning executed in the period 2002-2006 does not have the same effect everywhere. The most problematic remain the zones with the big transit water volumes – measuring a section from a trunk water main with distribution to an adjacent territory. The scheme increases by many times the error at measuring and leads to distortion of the balances.

The efforts in the period 2010-2015 were directed towards determining the zones with incorrect balances and the change of their schemes of measuring. Another problem at the measuring of trunk water mains is the low speed in them – it leads to increase of the error at measuring and is not recommended by all manufacturers of meters.

The change in the scheme of metering is related to large reconstructions and the change of the main water flows along the network. That is why the project is being implemented slowly – up to 5 zones per year.

At present there are still 13 zones which do not meet the internal standards for measuring.

Over the period of the business plan the project will work in the following aspects

- Change in the water supply scheme of 13 zones, at present measured at the transit trunk water mains
- The change in the type of measuring of 64 zones – from electromagnetic probes to a water meter on a bypass. It leads to a few positive effects:
    - Increase of the speed at the point of measurements – the bypass by rule is with smaller diameter than the main water main
    - Correct choice a a diameter of the bypass, and of the meter – based on the accumulated data after a few years of measuring
    - Installation of a device by comparatively low value, which in the future is maintained and replaced easily and by less subsequent costs
    - If necessary the zone is easily upgraded to zone with pressure management having already constructed shaft – additional installation of a PRV is possible or if there is not enough space – installation of a combined PRV with meter.
- Redesigning the entire telemetric system from SMS to GPRS, which will allow receiving data in real time – as a final goal are the daily balances of the zones, which will be available at any time to the employees engaged in the process of management of the network.

In view of the zones with pressure management as at 2016 about 95% of the network where pressure management is possible without violating the levels of service is covered by pressure management zones. For the rest where it is possible to apply it large-scale reconstructions are required to be able to form a pressure management zone. A good example is Ovcha Kupel 1 r.q, where for the implementation of the project it is necessary to replace the water main along Motevideo Blvd, which has been set in the investment program of the MoS for a few years, but has not been implemented due to the high cost of the project – the necessary funding exceeds BGN 3 M.

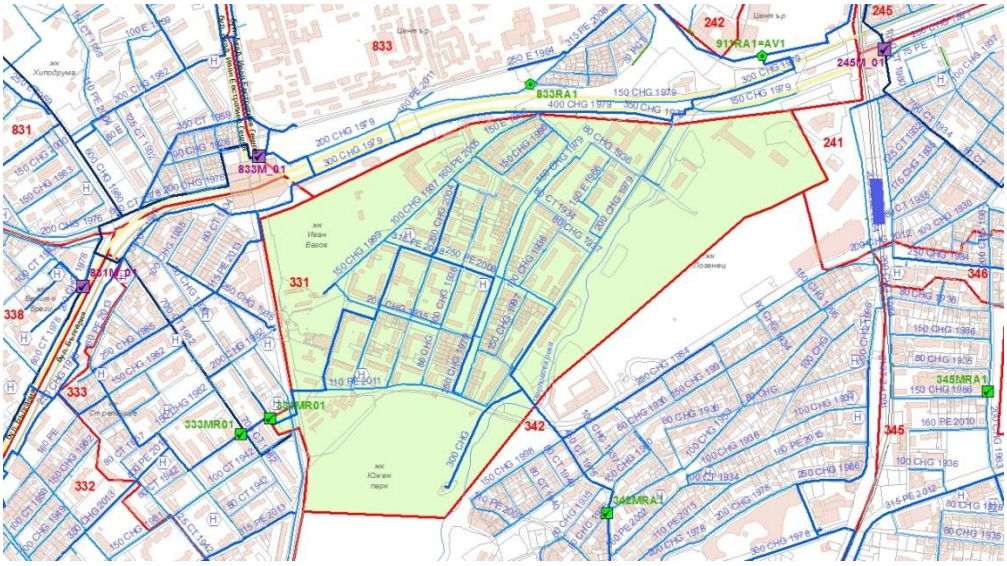
In 2016 will be added a few more zones to the ones with pressure management – in Dragalevtsi r.q, Lagera R.Q., Hipodruma r.q

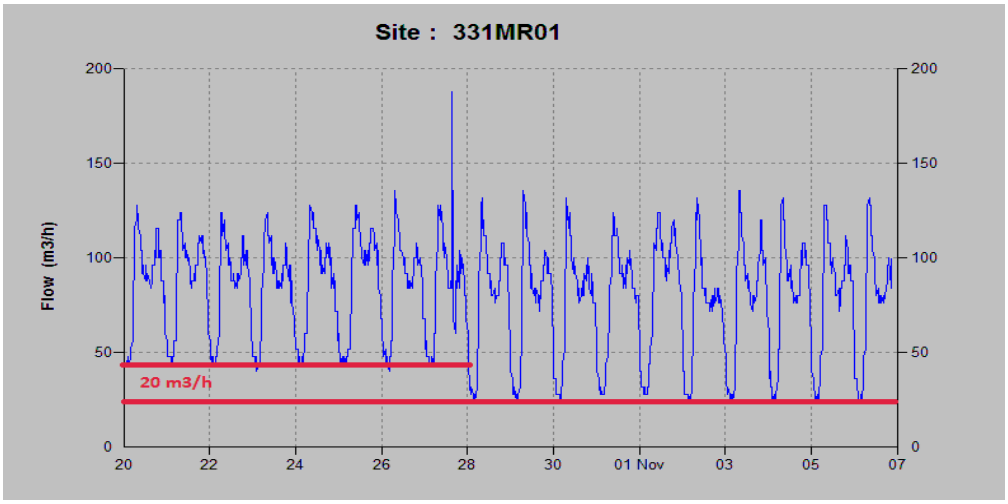
The development of the project within BP 2017-2021, will be executed in a few aspects:

- Dynamic pressure management –Upgrading the existing infrastructure with additional opportunities for change of the output pressure by the PRVs via guiding signal - consumption or time schedule. The expected effect is added value to reduction of leakage as well as of failures – which in general are mostly at night. The project was started in 2015 with 7 zones and the effect was positive for all. 6 of these zones are with 2-stage time schedule

management and 1 is for consumption. In 2 of the zones with time schedule by objective reasons, the result was more than 10% reduction of minimum nightline – Filipovtsi R.Q. and Ivan Vazov r.q.

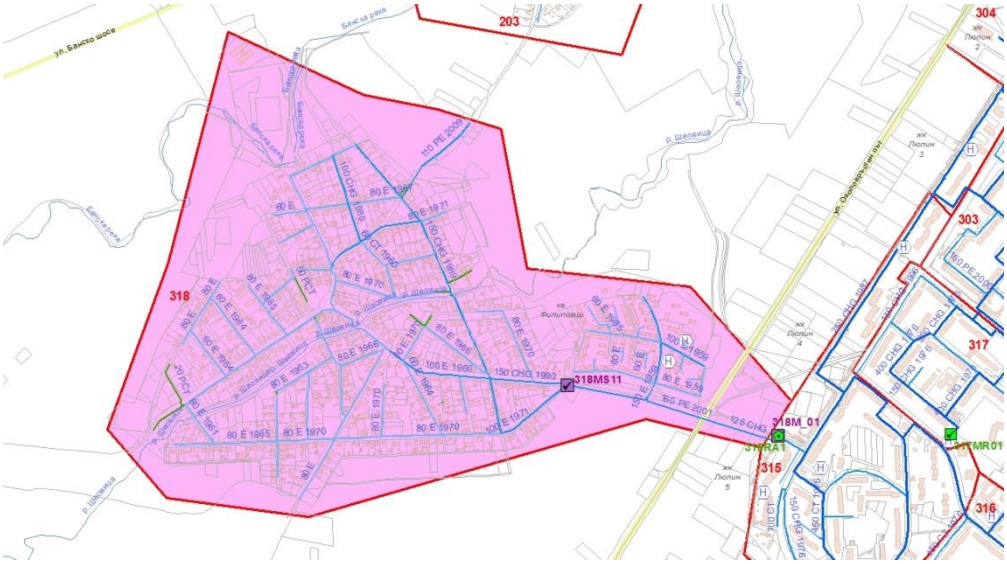
- DMA 331 – Ivan Vazov R.Q. - in this area, over the past years the company faced an unsolvable case due to the presence of an 18-floor block of flats whose residents refused a hydrophore to be installed. For this reason, the specific area was selected as a test one, and the method of two-stage pressure management was applied – additional reduction at night when the consumption is low.

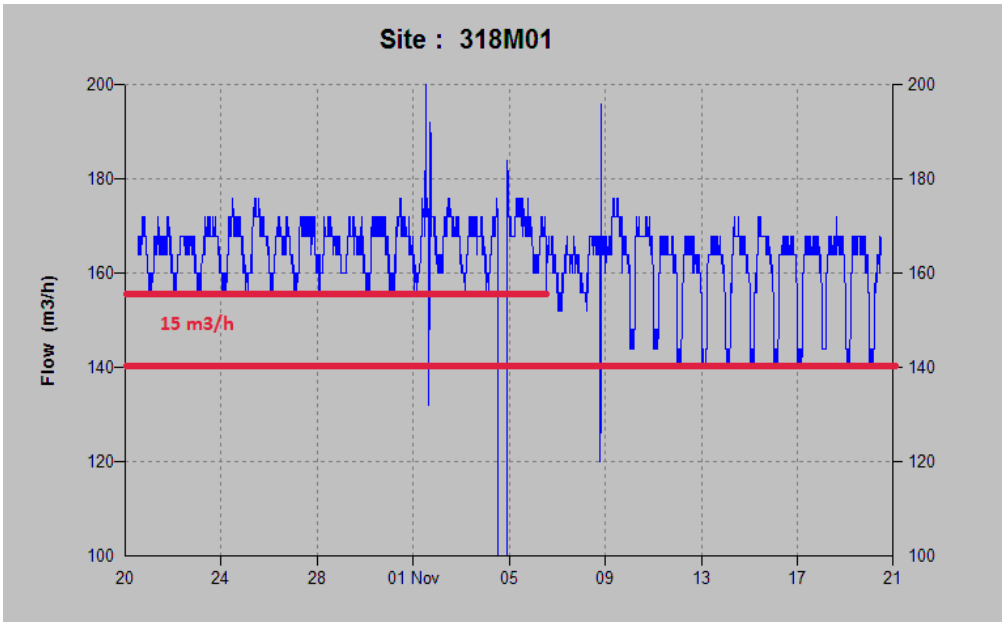




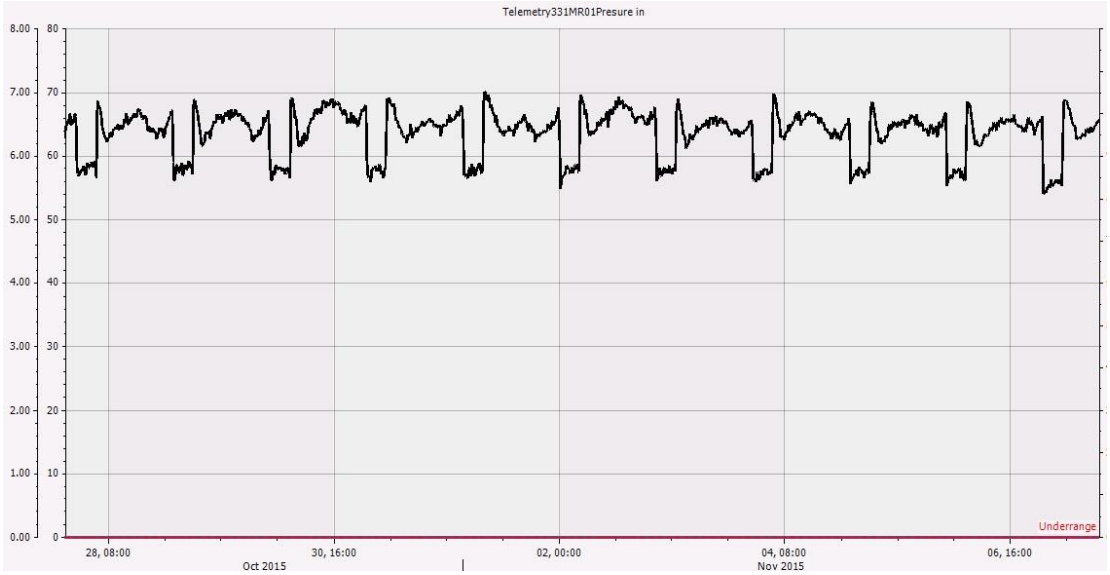
- DMA 318 – Filipovtsi R.Q. – a case, which cannot be solved with the conventional methods. There is an area within the residential quarter, mainly with compact Roma population, consuming without control around 75% of the supplied water volumes, and in practice the network is open. The dynamic pressure management reduced the

night flow by about 15 m3/ h without any tangible effect on the residents.





Principle of operation of the two-stage pressure management:



- Establishing new zones and re-zoning of already covered territories – it requires the construction or replacement of water mains meeting the updated developments – schemes, reinvestment study, preliminary and detailed designs. As result the main water supplies are changed and it is necessary to manage them. Over the period 2017-2021 it is expected such zones to be the villages of Vladaya, Bistritsa, Kokalyane, Simeonovo r.q. etc.
- Specifying output pressure in already existing zones – often the output pressure is higher than the theoretically achievable. The reasons are critical sections of the network in the zones – narrow places, clogging, connections in the network, high buildings without a pressure boosting installation, old water mains etc. The correction of such existing problems allows reducing additionally the pressure at supply of the area.

2.11. PROGRAM FOR ACTIVE CONTOL OF LEAKS

The active control on the leaks is one of the main priorities of SV in its efforts to reduce physical losses. As a company which uses cutting-edge technology for localization of leaks which do not show on the surface, SV has the following equipment for detecting leaks and tracing water mains:

Type	*Brand*	*Model*	*Number*	*Year of producttion*
Acoustic correlator	SEBA KMT	Corrélux P1	6	2008
Acoustic correlator	GUTERMANN	TM 2	1	2015
Sonic pipe locator	SEBA KMT	Hydrolux HL 5000	8	2012
Tracing device	METROTECH	9880	5	2008/2009
	VIVAX METROTECH	vLoc Pro	7	2012
Metal detector	METROTECH VIVAX	VM-880	7	2008/2012
Correlating loggers	PRIMAYER	Enigma	3	2012/2014
Correlating loggers	GUTERMANN	ZoneScan	1	2015

Video recording camera	SEBA KMT	vCam + 120 m push cable	1	2011

A short description of the principles of activities, the advantages and the disadvantages of each of the tools is given in Appendix 1

The teams of the company are equipped with the latest innovations in the field of hidden leaks detection. Over the last years it has become a practice to test each technological innovation in the field of active control of leaks

In 2015 were tested the latest technologies in the field of hidden leaks detection in view of their implementation in SV in the future.

A method was tested for hidden leak detection by helium – an inert and harmless gas, which does not exist freely in nature. The advantages of the method are a lot but the most important are that it is completely applicable and is the only one with proven efficiency at leakage detection in polyethylene water mains as well as to detect leaks with small flow for which the acoustic methods give mixed results. Moreover, the method is particularly suitable for grassed areas and in general terrains, white there is no laid road cover as the acoustic method gives unsatisfactory results on such territories.

An area of 0.5 km was surveyed in DMA 155 (Botunets), and 2 leaks were detected, including a very slow leak from an emergency

clamp:

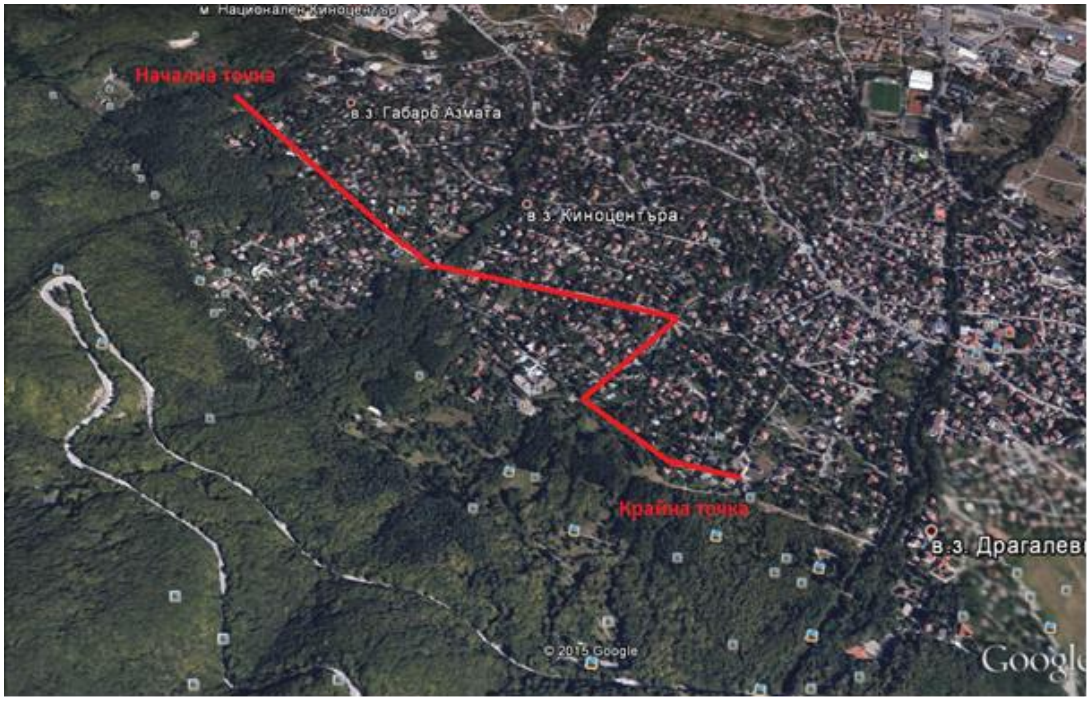
As a result of the tests made, 5 leaks were localized, and for them it was not possible to apply any acoustic methods or those methods had not given any results.

The success rate for the method is above 80%. In conclusion, the method is especially useful for water mains with a big diameter, in sections with no contact points – stop valves, hydrants, air valves, connections, etc. and also water mains with routes crossing areas with no pavement.

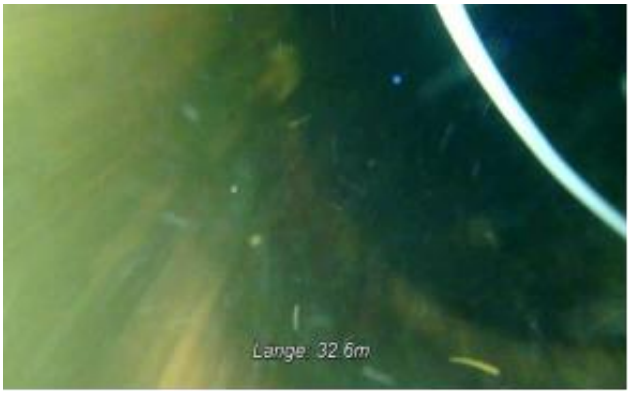
SV plans to purchase equipment for hidden leak detection through helium. It is expected the method to be tested at the beginning of 2017

Equipment for visualized inspection of water mains was tested (Pipe inspector). Through it the CCTV inspections of pressure pipelines are made and hidden leaks are localized through an acoustic method. The system does not require entire emptying of the water main and termination of the water supply along it for a long period of time. The length of the surveyed section in fact is limited only to the life of the battery of the camera and the free memory of the device and in fact such systems are used for survey of water mains with length of a few tens of kilometers

In the specific test project was surveyed a water main with diameter 300 mm and length of about 1.5 km in in DMA 433 (Dragalevtsi).



As result of the executed CCTV and ultrasound surveys 7 leaks were found in the mentioned route, as well as considerable debris inside the pipe.
The methods allow possibility for determining unknown connections to the water main, connections, old fittings, air release valves etc.



The test of the system for CCTV survey and localization of leaks was entirely positive and the company plans the purchase of such type of equipment in 2018.

In 2015 were executed 5,111 reactive works were executed (including leakage detection; tracing of water mains, service connections, stop valves etc.). In 2015 under program for proactive leakage detection 60 DMA zones were surveyed and 455 leakages were detected.

It is important to point out that the detection of hidden leaks of highly damaged water mains does not have a permanent impact due to the degree of wearing out and the frequency of the failures that occur along the water mains. For example, only in DMA 433 (Dragalevtsi) during the campaign for detailed survey of the area was detected

more than 120 hidden leaks and most of them were of highly damaged galvanized pipes with small diameters. The repair of single failures of water mains of such degree of wearing usually causes new failures of the water main.

In the current 2016 a test is to be made of the system for permanent correlation loggers and in the current business plan is set gradual introduction and establishment of a system for constant monitoring, consisting of acoustic correlating loggers. The first sensors are planned for 2017 and the gradual construction of the main part of the system will commence in 2019.Thus opportunity will be provided for sharp reduction of the time from the occurring of a hidden leak and its localization which will have direct impact on the reduction of the actual losses.

3. ANALYSIS AND PROGRAM FOR ACHIEVEMENT OF THE KPIS FOR THE SEWERAGE SERVIVE

3.1. ANALYSIS OF LEVEL OF COVERAGE OF SERVICES IN EVACUATION OF WASTEWATER

Sofiyska Voda JSC provides services in water treatment on the territory of Sofia and partly in the following locations:

- Bankya village
- Voluyak village
- Ivanyane village
- Novi Iskar town
- Pancharevo village

The information on level of coverage of sewerage service is in accordance with the included tariffs to customers for the "Sewerage" service in the billing system of the company for 2015 (Report 7 for number of customers of services, Report on implementation of BP 2016). As of 2015, the number of customers with included tariff “Sewerage” is 553,598

Under the new Instructions of EWRC on the application of Ordinance for regulating the quality of the water supply and sewerage services, the percentage coverage of sewerage in partly served settlements is defined as the number of customers of the service is multiplied by the average number of persons in a household which for Sofia is 2.2. The recalculated data for 2015 show 92.8% coverage with this service. At the end of the period of the BP, the company plans to increase this percentage to 96.48%, taking into account the customers newly-connected to sewerage, as a result of planned execution of sites of the investment program (extension of the sewerage network in Voynyagovtsi, Benkovski, Gorublyane, Moderno predgradie).

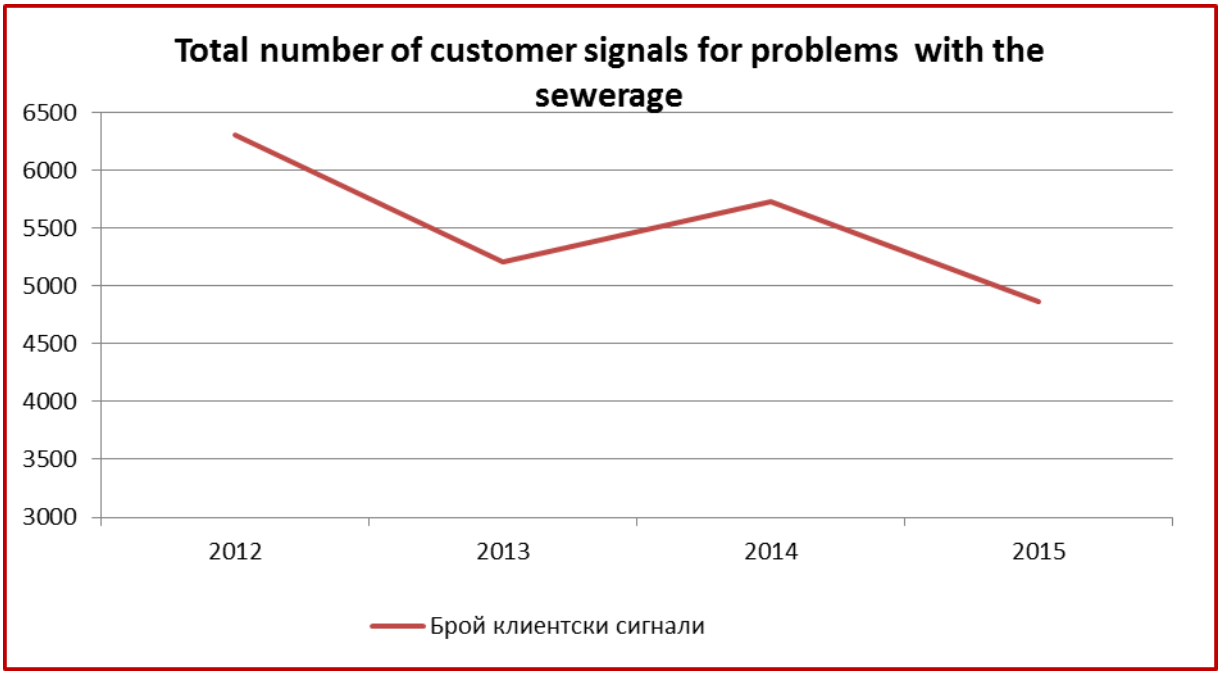
3.2. ANALYSIS OF FAILURES ALONG THE SEWERAGE NETWORK

The failures in the sewerage network in compliance with the current instructions of the EWRC are separated in 3 categories – clogging n the sewerage network, different from the ones of the sewer service connections (SSC), clogging of SSCs, and failures of the sewerage network due to structural destruction.

In view of the wearing of the network (90 km from the network in the central urban part are more than 100 years old) and the pace of the investments we expect to keep the same pace of failures, related to the structural destruction of the sewers. Moreover, the efforts of the company for implementation of programs from proactive measures (CCTV survey, preventative maintenance of the sewerage network, survey of the passable trunk sewer) show structural problems of the sewerage network, which the company aims at repairing before they cause inconveniences for the customers. The activity contributes to the reporting of higher number of failures. It is expected also to increase the share of the failures of the trunk sewers which required considerably higher resource for their repair and are connected to higher risk (in 2014 a structural issue occurred with a trunk sewer along Rezbarska St. 200/205 cm, in 2015 – with sewer Φ 110/165 along Christopher Columbus Blvd. and in 2016 – with trunk sewer along *Petko Yu. Todorov* Blvd. Φ70/105). Each of these structural issues is related to a risk for vehicles which pass over the facility and the repair of the problem requires considerable financial resources.

Actuals 2015	Estimates						
Year	2015	2016	2017	2018	2019	2020	2021
Number of structural failures	66	72	66	66	66	66	66

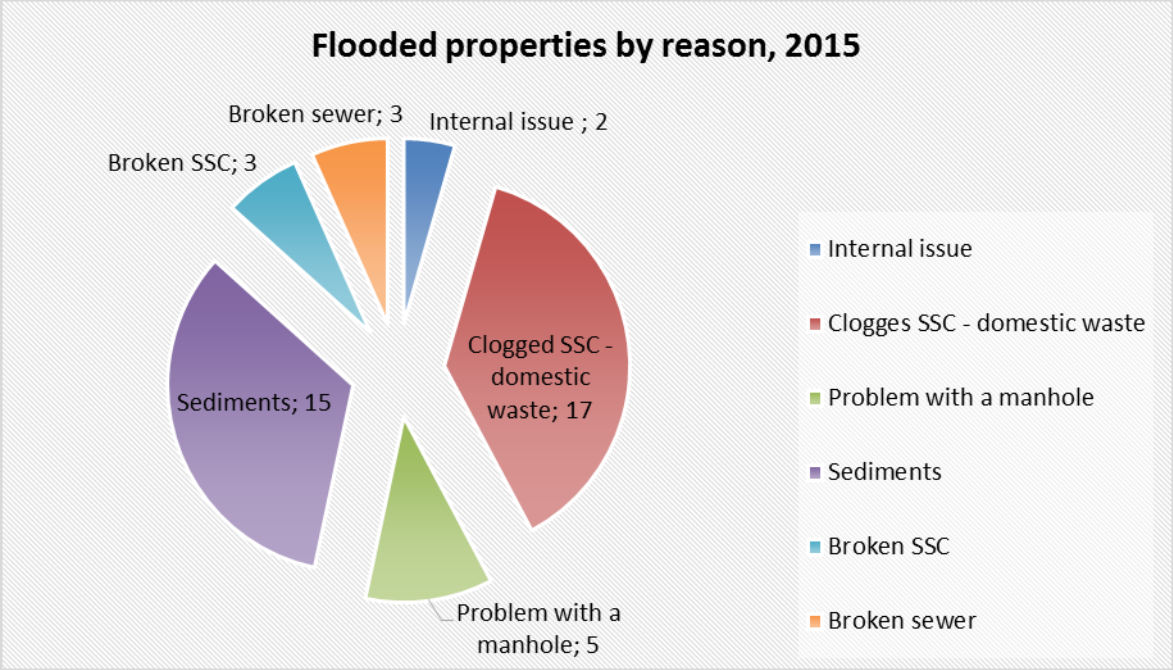
It is important to emphasize that as result of the targeted proactive work of the sewerage system of the MoS over the period 2012-2015 there was a visible tendency for reduction of customers' signals for problems with these facilities. It is evident that even the highly rainy 2014 did not cause significant inconveniences for our customers.



The estimates for the next 5-year period are for increase of the proactive cleaning of the network, which for 2015 is 156 km. For 2016 is planned to clean 165 km, which is to lead to reduction of the clogging in the network resulting from the generation of sediments. It is planned in the period 2017-2021 to keep the pace of cleaning of the sewerage network, which is expected to be achieved in 2016.

3.3 ANALYSIS OF FLOODS IN PROPERTIES OF THIRD PERSONS CAUSED BY SEWERAGE

The flooded properties by types of reasons in 2015 are shown in the chart below. In 2015 flooding of properties due to insufficient diameter was not registered. As result of rainfall, in specific critical points of the sewerage network sediments and waste accumulate, which cause clogging and in some cases it accelerates the process of destruction at the existing structural issues. The reduction of the inconveniences for the customers is achieved by increase of the share of proactive cleaning of the network by which is reduced the number of the sites, flooded due to sediments in the street sewer, and preventative repairs and replacement of sections from the network. Thus, will be limited the floods in properties, resulting from structural destruction of sewer service connections or street sewers).



The chart reflects all confirmed terrain floods and recorded signals in software application Pegasus (i.e. not only includes written reports)

Significant impact on the operation of the sewerage network will have also the increased number of surveys through CCTV survey of sections from the network. The aim is each site with a repeated problem to be surveyed by a camera in view of detailed ascertaining of the reasons and their permanent repair. An important condition for the quality survey of the network by cameras for video monitoring is the execution of cleaning in advance. By video monitoring will be executed also an inspection of the quality of the preventative maintenance:

At the moment the teams of the company have 3 types of cameras:

- Sewer push camera – applicable for sewer service connections
- Telescopic cameras – for quick inspection of the sewers through the manholes (with strong lighting and high zooming of the picture)
- Robor camera - for survey of sewers from Ф300 до Ф1200 with coding of the defects determined along the network and registration of connections and option for data export to the sewerage model

Creation of a team for survey of trunk sewers

At the beginning of 2016 to Sewerage Services was created a team for survey of passable trunk sewers. The formation of the team was possible due to the automation of the activities in the treatment plants and the re-allocation of the necessary human resources. It is planned the team to be consist of 6 terrain specialists and a head of the team, which in accordance with a schedule will inspect the condition of the passable trunk sewers on the territory of the concession area. Since the formation of the team until the preparation of this document have been surveyed more than 10 km of trunk sewers in the MoS. During the inspections are

found a number of “hidden” at that time defects of the sewerage facilities, whose repair is important for the future operation of the network

4. ANALYSIS AND PROGRAM FOR ACHIEVING THE QUALITY INDICATORS IN RELATION TO THE SERVICE WASTE WATER

4.1. ANALYSIS OF LEVEL OF COVERAGE OF SERVICES IN WASTEWATER

According to the Instructions of EWRC, the level of coverage of wastewater treatment service is recalculated, and for 2015 this percentage is 89.66%. It is calculated as the number of customer IDs /537 896/ is multiplied by the average number of persons per household / 2.2, according to data from NSI /. By the end of the regulatory period, the company plans this rate to reach 91.47%, as the forecast is consistent with the projects included in the investment program.

4.2. ANALYSIS OF THE QUALITY OF WASTEWATER ENTERING FOR TREATMENT THE WWTP WITH ASSESSMENT OF THE CONTRIBUTION OF THE DOMESTIC FLOW, THE INDUSTRIAL WASTEWATER, STORMWATER AND INFILTRATION; COMPLIANCE WITH THE QUALITY STANDARDS AT THE OUTLET OF THE WWTP

The monitoring of the quality of wastewater is implemented on the basis of the requirements of the permit for discharge of treated wastewater, as well as of a plan for own monitoring. The monitoring of the quality of treated wastewater implemented in 2015 shows compliance with the parameters set in the discharge permit. It is expected the tendency to be kept until the end of 2016 and over the whole period until 2021.

In 2015 were ascertained and legalized a number of illegal discharges to the sewerage system of rivers and other surface water flows, which increase the hydraulic load on the treatment plant for wastewater and respectively lead to increased costs for treatment and difficulties in the processes. During the second half of the reporting year, the proactive measures in the sewerage network led to a decrease in the hydraulic load at the inlet of SWWTP up to levels normal over the last years, together with an increase in the concentration of BOD_5.

At the end of 2015 a new station was installed for automatic analysis at the outlet of the WWTP, which provides data in real time for the quality of the treated water and allows taking timely corrective measures in case of potential deviations. Replaced are 6 flow meters with poor technical condition for air to the aeration tanks with new more reliable and accurate devices, which will allow more accurate regulation of the

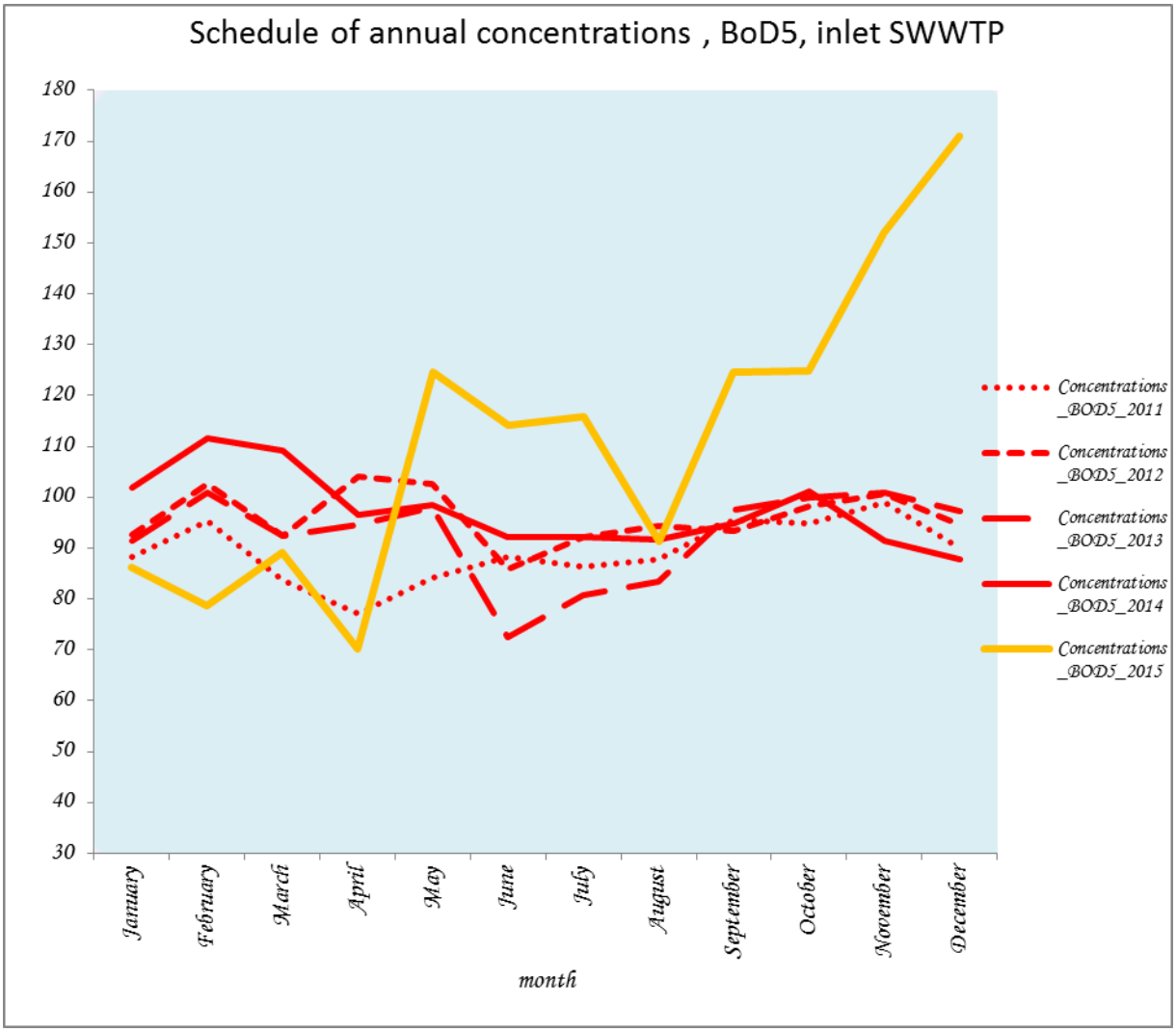
supplied air, after the implementation of the project for replacement of the system with air blowers with a more efficient one.

In 2016 is about to be implemented a project for replacement of 2 nos of air compressors, which are with worsened technological parameters, by 4 efficient adjustable compressors, which are to be integrated to the STAR system and it is expected to lead to optimization of the process of removal of nitrogen from wastewater and to some saving of energy consumption.

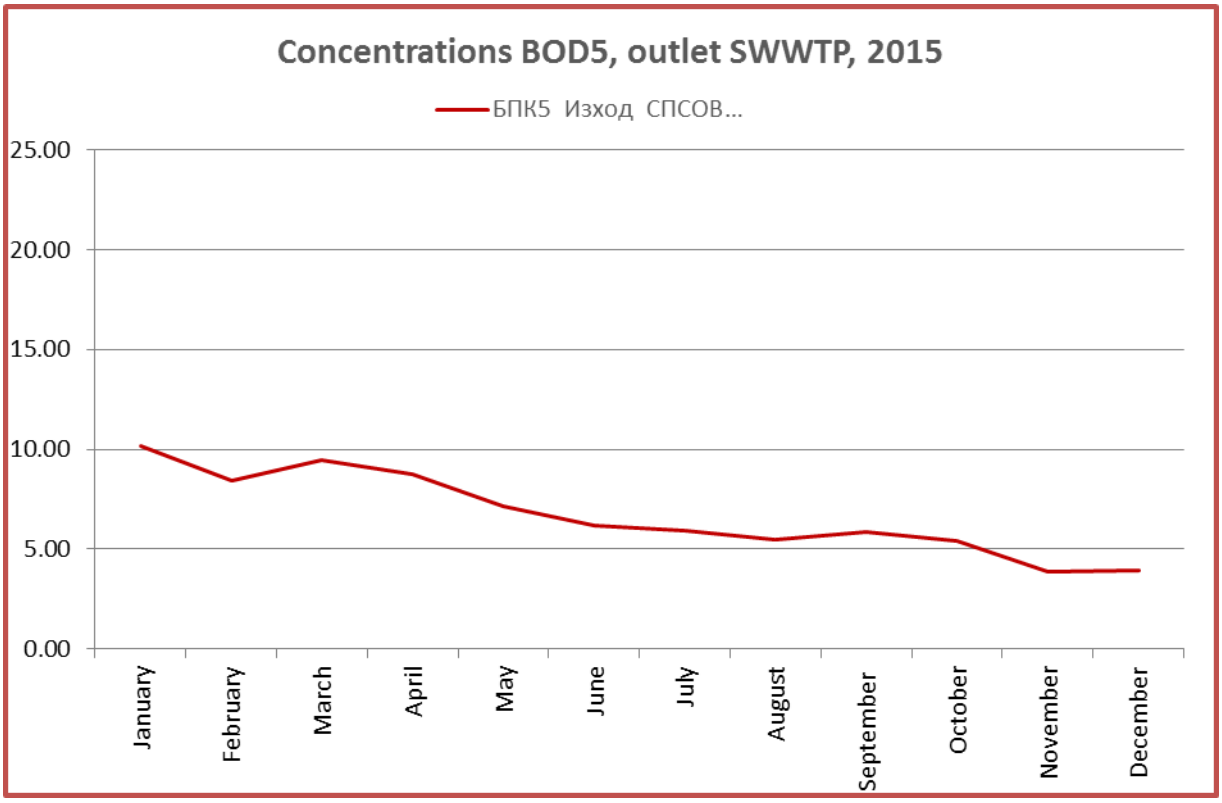
Over the period of BP 2017-2012 is planned survey and possibly application of measures for preliminary processing of the sewage, formed during the processes of sludge treatment, which will reduce the secondary pollution at the inlet of SWWTP and will be a prerequisite for increase of the efficiency of the biological stage. In parallel it is planned to develop a system for use of the treated water for the technical needs of the line for thickening of the surplus activated sludge, which will reduce the consumption of potable water in the treatment plant.

In 2017 is envisaged the construction of automate station for analysis of the quality of the water at the inlet of SWWTP as well, which will provide data in real time for the level of pollution of the inlet flow, and it will be a prerequisite for prevention in cases of shock pollution and timely measures for adjustment of the treatment process. It is also envisaged to purchase a small energy efficient boiler, which will be operated if additional heating of buildings and sludge digesters is necessary during the winter.

In the investment program are envisaged money for repair and maintenance of the concrete roads to the primary and secondary settling tanks as well as for repair of buildings, roads and facilities – reaction tank, replacement of sewerage branches, repair and reconstruction of sludge thickeners at the Mechanical Sludge Dewatering unit, which will ensure the accident-free work at SWWTP



The increase of the concentration of organic pollutants lead to higher efficiency of the treatment processes, improvement of the indicators at the outlet of SWWTP, which in combination with the lower energy demands allowed achieving 107% energy efficiency of Kubratovo WWTP. This indicator is a major way of measurement of the efficiency of the treatment processes and in 2015 SV ranks first among all operated facilities in more than 40 countries in Veolia group.



The chart above shows the results for treatment of BOD_5 during the base year, which keep stable tendencies at increased concentration at the inlet of the treatment equipment.

One of the main objectives of the company is over the period 2017-2021 the survey of the sewerage branches to continue with increased paces, and the infiltration and the illegal discharged of surface water to be additionally limited.

In 2015 the treated wastewater discharged in Iskar River met completely the requirements, set in the discharge permit.

4.3 ANALYSIS OF THE DATA FROM THE IMPLEMENTED MONITORING ON THE QUALITY OF DISCHARGED PRODUCTION WASTEWTAER IN THE URBAN SEWERAGE ENETRING THE WWTP FOR TREATMENT – REGISTER OF THE CONTROLLED ENTERPRISES (GROUPED BY LEVELs OF POLLUTION IN COMPLAINCE WITH THE DATA FROM THE LAST ANALYSES MADE OF THE FORMED WASTEWATER FROM THESE ENTERPRISES OVER THE REPORTING YEAR), SIGNED CONTRACTS AND POLLUTANTS

The control over the industrial enterprises will be implemented in two main aspects – sample taking and survey. Over the period 2016-2021 the control over industrial

customers will be executed by separation of the concession area into two geographic regions. For enterprises in each region an inspector will be responsible helped by a laboratory specialist sample taking. The visits of the production sites will be executed in the range of preliminary planned schedule. The connection of newly sites, removal of existing sites, as well as the execution of additional sample takings due to contractual clauses or the inability for execution of sample taking at a previous visit, determine a more dynamic schedule of the visits than the preliminary planned.

The survey of sites will be carried out in parallel with sample taking for determining a change in the scope of the activity, technology, the site infrastructure, the ownership of the site, are there leased premises and rented areas. The results are presented on a line with ID number against the name of the user of the production site, customer of SV, address and municipality. The analysis of the results and their comparison with the ones from the last year make us jump at the following conclusions:

1. Controlled for the period 2016-2021 will be about 690 production sites.
2. The total volume for the period 2017-2021 of the industrial flow will be about 5 000 000 m³/year.
3. The load for the period 2016-2021 in terms of suspended solids will be about 600 000 kg/year.
4. The load for the period 2016-2021 by BOD_5 will be about 1 000 000 kg/year.
5. The load for the period 2016-2021 by petrochemical will be about 1 600 kg/year.
6. In the table below are given enterprises with highest expected value respectively for water volume, load of suspended solids, load of BOD5 and load of petrochemicals

Table: Enterprises with the highest expected values for the period 2016-2021

Name	Address	Municipality	Q ,m³/year
District Heating Sofia EAD, Sofia Iztok Power Plant	ул. "Д. Пешев" № 6	ISKAR	1 050 000
District Heating Sofia EAD, , site:HPP Sofia	ул. "202-ра" № 6	SEDIKA	450 000
Sopharma AD, site A	ул. "Илиенско шосе" № 16	NADEZHDA	350 000
Name	**Address**	**Municipality**	**Suspended solids total, kg/year**
Proekt treid OOD	ж.к. Хаджи Димитър, бл.67	PODUYANE	110 000
Chistota Iskar EOOD	ул. „Iskarско шосе”№ 2	ISKAR	45 000
Erozak OOD	ж.к. Борово, бл.223А, вх.Д, маг.8	KRASNO SELO	45 000
Name	**Address**	**Municipality**	**BOD_5, kg/year**
Proekt treid OOD	ж.к. Хаджи Димитър, бл.67	PODUYANE	200 000
Chistota Iskar EOOD	ул. "Iskarско шосе" №2	ISKAR	175 000
Erozak OOD	ул. "Илиенско шосе" № 16	NADEZHDA	85 000
Name	**Address**	**Municipality**	**hydrocarbon oil index, kg/year**
Verilsa Services AD	с. Равно поле, общ. Елин Пелин	ISKAR	1050
Sofia Med AD	ул. "Димитър Пешев" № 4	ISKAR	200
District Heating Sofia EAD, Sofia Iztok Power Plant	ул. "Д. Пешев" № 6	ISKAR	150

4.4. ANALYSIS OF SLUDGE UTILIZATION AT SWWTP

4.4.1. Planned and implemented analyses of sludge, including by an accredited laboratory

The planned and implemented analyses of sludge from the drying beds, envisaged for sludge utilization are in compliance with the Ordinance on the procedure and way of utilization of sludge from wastewater treatment by use in agriculture dated April 8 2015. In 2015 were planned and executed 4 analyses of each of the stated indicators: agrochemical indicators, heavy metals and arsenic, microbiological and parasitological indicators and 1 analysis for persistent organic pollutants. The number of the planned tests is determined depending on the volume of generated sludge in tons dry substance per year, depending on the criteria in Appendix 6 from the Ordinance cited above.

At the same time analyses are carried out of the sludge by the LTC of SV at the loading and before transportation to the drying beds.

4.4.2 Used methods for sludge treatment

In Kubratovo WWTP is processed the primary sludge, generated at the mechanical treatment of water and surplus activated sludge, generated during the process of biological treatment

Surplus activated sludge enters 2 sludge thickeners and is thickened by gravity. Then it heads for mechanical thickening with flocculants and by 1 belt thickener.

The thickened and primary sludge are mixed and stabilized anaerobically in 4 anaerobic stabilizers, where they stay between 15 and 20 days. The stabilized sludge enters two sludge thickeners where it is dewatered in 5 filter pressed using flocculants. The dewatered sludge is mixed with quick lime for hygienic purposes and compliance with the required parameters for use in agriculture and is distributed on the drying beds

4.4.3 Description of the method for utilization and disposal

The sludge generated at the treatment of wastewater in SWWTP is analyzed using the determined in the ordinances procedure for utilization of sludge from wastewater treatment by use in agriculture and the relevant permits are issued. Sludge utilization is done in massifs, owned or taken on lease by people who are provided with the relevant analyses and permits. The transport, spreading and tilling of the sludge is executed at the expense of the company.

4.4.4 Economic evaluation, BGN/ton dry substance for utilized/disposed sludge

The costs for sludge utilization for 2015 amount to 37.76 BGN/ tons dry substance

4.4.5 Program for utilization of the accumulated before and the generated during the regulatory period sludge

By decision No 423 dated 09.07.2015 Sofia Municipal Council approved the prepared by the working group with experts from SV and the MoS “Strategy for management of sludge, generated at the treatment of the wastewater of the MoS until 2025”. A copy of the strategy was submitted to the EWRC with BP 2916 and since them the same has not been changed.

At the time for preparation of this document was finalized an assignment to a contractor for preparation of regional pre-investment surveys for the territory of the MoS. In the assignment is set a requirement for planning and implementation (if possible by European funding) of a solution for sustainable management of sludge generated on the territory of the MoS

Until the implementation of the measures, set in the strategy, the generated and accumulated sludge will be utilized using the established at the moment model.

5. ANALYSIS AND PROGRAM FOR IMPROVEMTN OF THE EFFICIENCY OF THE COMPANY

5.1 ANALYSIS OF ENERGY EFFICIENCY FOR WATER SUPPLY

In 2015 were conducted the following activities for improvement of energy efficiency

- Reconstruction of the pumping station Podgumer and replacement of the pumping units.
- Reconstruction of the lighting at Pancharevo PWTP with energy-efficient lighting.
- Reconstruction of the lighting at reservoirs – Dragalevtsi, Moderno Predgradie, Lozishte, Lozenets, Boyana with energy-efficient lighting.
- Installation of frequency regulators on accessory pumps for chlorination at Boyana chlorination station.
- Installation of frequency regulators on pumps for domestic waters of the sewerage pumping station Novi Iskar. The pumps will be included in regime of optimal work after installation of air blowers on the pressure.
- Rehabilitation of Central Dispatching Point Pancharevo, repair activities of a roof on filter house in PWTP Bistritsa.
- Installation of frequency regulators of groups of pumps for Katina - new in Dobroslavtsi pumping station and frequency regulators for pumping group Seslavtsi in pumping station Kremikovtsi is planned.

The main changes in the electricity consumption for the period of the business plan for water supply to customers are presented in the table:

Project	Service	Tariff	expected impact EE kWh / 2017	expected impact EE kWh / 2018	expected impact EE kWh / 2019	expected impact EE kWh / 2020	expected impact EE kWh / 2021
Water-absorbing system in the filter house PWTP Bistritsa	Water supply	CH	35 000	35 000	35 000	35 000	35 000
PS Vladaya	Water supply	CH	0	300 000	291 006	281 952	273 511
Process water Pancharevo	Water supply	CH	56 000	56 000	56 000	56 000	56 000
Change based on the changes in the water volumes at the inlet of Pancharevo and Bistritsa PWTPs	Water supply	CH	-76496	-225358	-263548	-372244	-506585

The facility for accumulation of process water in Pancharevo PWTP is a new site, which is expected to be commissioned in 2016.
Within the regulatory period it is planned to construct and commission a water-absorbing system in the Filter House of Bistritsa PWTP and a new PS for supply of the village of Vladaya with stated impact on the electricity consumption by years.
The expected decrease in the unaccounted-for water in the distribution network should have a positive impact on the electricity consumption for the process of potable water treatment. In the table above is presented the reduction in the consumption of the treatment plants using consumption for treatment of 1 m3 in the two treatment plants in 2015 and making a simulation for the consumption at the water volumes, which are excepted to be treated for each of the years of BP 2017-2021.

5.2 ANALYSIS OF ENERGY EFFICIENCY FOR SEWERAGE

The company operates 4 sewage pumping stations (SPS) for draining of wastewater – SPS Novi Iskar, SPS Gorublyane, SPS Iliyantsi, SPS Benkovski. The pumping stations are new with modern equipment meeting the energy efficiency standards. The SPS's work in automatic mode having implemented at optimal settings of the working modes. SPS Gorublyane and Iliyantsi are connected to SCADA for water management and can be operated remotely. SPS Novi Iskar and Benkovski are controlled by the technological SCADA in the SWWTP. In 2015 on 3 pumps in SPS Novi Iskar PLCs were installed by which the volume of the water discharged in SWWTP is controlled remotely. Over the period 2017-2021 is planned to provide a diesel generator for sewage pumping station Novi Iskar as well as to deliver and provide a new control panel with the generators' section. The pumping station does not have a drainage system. It is supplied by a second electricity source from a substation. In case there is no electricity from the two inputs, there is a risk of flooding due to rain. The diesel generator will supply the pumps in case of emergencies.

5.3 ANALYSIS OF ENERGY EFFICIENCY FOR WASTEWATER TREATMENT

2015 was the most successful in the history of the company in terms of energy efficiency of wastewater treatment and the total consumed energy was 18,565 MVHR whereas the generated was 19,941 MVHR or by 7% higher than the consumption of the plant. Such ratio is very rare and is verification of the quality management of the treatment process by the employees in the company. The existing anaerobic digesters work almost close to their designed capacity and the process of generation of biogas is effective, but 2017 will be the tenth year of continuous work and it is necessary to plan gradual emptying and inspection of the facilities in explosive environment in terms of heat insulation, repair of defects and inorganic sediments, which reduce the useful volume. The repair of each of the digesters would reduce the

generated electricity and heat by 25% and it is possible to import electricity and fuel for heating necessary for the production.

In order to avoid increase in the costs for the activity during the repairs in BP 2017-2021 is proposed a project for construction of an additional anaerobic digester, which will take the volume of sludge for stabilization during the work on each of the other digesters. Last, but not least the project it will contribute to preventing the disposal of raw sludge in nature.

Some of the additionally planned projects having impact on energy efficiency are:

- Extension of the system for energy monitoring in the units in SWWTP
- Thermo- insulation is being constructed of the roof, installed is heat insulating membrane on the roof construction, the joinery is replaced, thermo- insulation of the building, replacement of the heating, ventilation and the electric installations. The projects for the building meet the highest standards for energy efficiency.
- Delivery and installation of new air blowers in Kubratovo WWTP – their replacement aims at achieving optimum work of the biological stage, reduction of the electricity consumption and improvement of the processes of wastewater treatment.
- Replacement of of the lights in the units in SWWTP with energy efficient ones.

To the electricity consumption for treatment will be added the consumption for the local treatment plant for wastewater Vojnyagovtsi after its commissioning.

Проект	УСЛУГА	ТАРИФА	Очакван ефект ЕЕ kWh / 2017	Очакван ефект ЕЕ kWh / 2018	Очакван ефект ЕЕ kWh / 2019	Очакван ефект ЕЕ kWh / 2020	Очакван ефект ЕЕ kWh / 2021
ЛПСОВ Войняговци	пречистване	СН	350000	350000	350000	350000	350000
Саниране на анаеробните изгнивателi	пречистване	ВН	-4985250	-4985250	-4985250	-4985250	-4985250
Изграждане на допълнителен анаеробен изгнивател	пречистване	ВН	4985250	4985250	4985250	4985250	4985250

5.4 ANALYSIS OF THE EFFICIENCY OF THE COSTS FOR THE WATER SUPPLY SERVICE

According to the instructions comparison of the following cost elements towards the reporting 2015 is presented below.

WS Sofia

Water supply to customers

With the exception of the costs for depreciation, remunerations and social contributions, the costs in real terms decrease as compared to 2015 as follows (in k BGN):

No	Costs for economic items	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**	**3 504**	**3 330**	**3 312**	**3 281**	**3 243**	**3 209**
2	**Costs for hired services**	**18 247**	**17 637**	**17 505**	**17 325**	**17 251**	**17 008**
3	**Taxes and charges**	*3 647*	*3 556*	*3 455*	*3 367*	*3 280*	*3 199*
4	**Other expenses**	**1 239**	**902**	**888**	**874**	**859**	**844**
5	**total expenditure**	**26 637**	**25 425**	**25 160**	**24 846**	**24 633**	**24 260**
6	**compared to 2015**		-1 212	-1 477	-1 791	-2 005	-2 377

Variation per cost items as compared to 2015:

No	Costs for economic items	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**		**-174**	**-192**	**-223**	**-261**	**-295**
2	**Costs for hired services**		**-611**	**-742**	**-922**	**-997**	**-1 239**
3	Taxes and charges		*-91*	*-192*	*-280*	*-367*	*-448*
4	**Other expenses**		**-337**	**-351**	**-365**	**-380**	**-395**
5	Variation compared to 2015-total		-1 212	-1 477	-1 791	-2 005	-2 377

Costs for materials

The main reasons for the achieved efficiency are:

- *Costs for electricity:* combined effect of the measures for energy efficiency and price effect from the forecast of the costs under the effective prices at the time of developing this business plan under the conditions of prices for supply at a free market. Detailed information is provided in **Section IV. Cost analysis**;

- *Costs for chemicals:* mainly quantitative effect as a result of the improvement of the indicator for the losses in the water network and respectively the lower volume of abstracted water in each year. Detailed information is provided below in **Section III, it. 4 Cost analysis**;

Costs for hired services

The main reasons for the achieved efficiency are:

- *Costs for repair*: quantitative effect from the decrease in the number of repairs in the water supply and the planned by the Company increase in the share of repairs performed with internal resources and decrease in the amount of the jobs assigned to contractors;
- *Costs for insurances*: price effect under the effective prices as per the last renewed contracts, plus an effect from the reclassification resulting from the costs unrecognized in conformity with the Instructions on the prices for additional health insurance in the period 2017 – 2021.

Taxes and fees

The main reasons for the achieved efficiency are:

- Quantitative effect resulting from the improvement of the indicator for the losses in the water network and respectively the lower volume of abstracted water in each year. Detailed information is provided below in **Section III, it. 4 Cost analysis**;

Other costs

The reasons for the decrease per years are: decrease in the annual costs with regard to ISPA as a result of the updated repayment schedule (Detailed information is provided below in **Section III, it. 4)** decrease as a result of the higher costs referred to WS Bozhurishte in proportion to the volumes 2017 - 2021 (Detailed information for this adjustment is given below in Section IV), adjustment with one-off costs in 2015, which will not be incurred in the coming years.

WS Beli Iskar

With the exception of the costs for depreciation, remunerations and social contributions, the costs in real terms decrease as compared to 2015 as follows (in k BGN):

№	Costs by economic items	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**	**4**	**4**	**4**	**4**	**4**	**4**
2	**Costs for hired services**	**37**	**22**	**27**	**23**	**38**	**22**
3	Taxes and charges	*173*	*185*	*187*	*181*	*178*	*175*
4	**Other expenses**	**30**	**0**	**0**	**0**	**0**	**0**
5	**total expenditure**	**243**	**211**	**218**	**208**	**220**	**201**
6	Decrease compared to 2015		-32	-25	-35	-23	-42

№	Costs by economic items	Actuals as at 31.12.2015.	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**		**0**	**0**	**0**	**0**	**0**
2	**Costs for external services**		**-15**	**-9**	**-14**	**2**	**-14**
3	Taxes and charges		*12*	*14*	*8*	*5*	*2*
4	**Other expenses**		**-29**	**-29**	**-29**	**-29**	**-29**
5	Variation compared to 2015..		-32	-25	-35	-23	-42

The decrease in the costs is due to:

- *Hired services:* price effect under the effective prices as per the last renewed contracts, plus an effect from the reclassification resulting from the costs unrecognized in conformity with the Instructions on the prices for additional health insurance in the period 2017 – 2021. The increase in 2020 is due to planned costs for diving inspection of the dam wall.
- *Taxes and fees*: variation in the fee for the use of water bodies in line with the provided below justification in **Section III Financial part, it. 4 Cost analysis**;
- *Other costs*: adjustment with one-off reported cost in 2015.

WS Bozhurishte

The variations are mainly due to the adjustment described in **Section III. Financial part, it. 4. Cost analysis** in other costs in line with the justification for compliance of allocated cost with the respective water volumes per years.

№	Costs by economic items	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**	**1**	**1**	**1**	**1**	**1**	**1**
2	**Costs for hired services**	**5**	**5**	**5**	**5**	**5**	**5**
3	Taxes and charges	*3*	*3*	*3*	*3*	*3*	*3*
4	**Other expenses**	**0**	**32**	**33**	**34**	**36**	**37**
5	**total expenditure**	**9**	**41**	**42**	**43**	**45**	**46**
6	Variation compared to 2015		31,71	32,40	33,76	35,23	36,67

№	Variance of the Costs for economic items compared to the reported 2015	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**		**0**	**0**	**0**	**0**	**0**
2	**Costs for hired services**		**0**	**0**	**0**	**0**	**0**
3	Taxes and charges		*0*	*0*	*0*	*0*	*0*
4	**Other expenses**		**32**	**33**	**34**	**35**	**37**
5	Variation compared to 2015 -total		31,71	32,40	33,76	35,23	36,67

WS Non-potable

With the exception of the costs for depreciation, remunerations and social contributions, the costs in real terms decrease as compared to 2015 as follows (in k BGN):

№	Variation of costs by economic items compared to the reported 2015	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**	**115**	**108**	**108**	**107**	**106**	**106**
2	**Costs for hired services**	**1 022**	**917**	**865**	**854**	**844**	**832**
3	Taxes and charges	*353*	*397*	*331*	*327*	*323*	*319*
4	**Other expenses**	**29**	**16**	**16**	**16**	**16**	**16**
5	**total expenditure**	**1 518**	**1 437**	**1 320**	**1 304**	**1 289**	**1 273**
6	Variation compared to 2015		-81	-198	-214	-229	-245

№	Variation of costs by economic items compared to the reported 2015	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**		**-7**	**-7**	**-8**	**-9**	**-9**
2	**Costs for hired services**		**-105**	**-157**	**-168**	**-178**	**-189**
3	Taxes and charges		*44*	*-22*	*-26*	*-30*	*-34*
4	**Other expenses**		**-13**	**-13**	**-13**	**-13**	**-13**
5	Variation compared to 2015.-total		-81	-198	-214	-229	-245

As it is clarified in detail in **Section III Financial part p.4,** the variations are due to:

- *Materials:* decrease in the costs for electricity for process needs;
- *Hired services:* price effect under the effective prices as per the last renewed contracts, plus an effect from the reclassification resulting from the costs unrecognized in conformity with the Instructions on the prices for additional health insurance in the period 2017 – 2021. A considerable decrease has been forecast in the costs for water supply from other supplier in line with a draft decision for change of the prices for supply of Irrigation

Systems EAD (http://dker.bg/KAPDOCS/res-draft-napoitelni-sistemi.pdf). The recalculation of the forecast cost is given in **Section III Financial part. it. 4**.

- *Taxes and fees*: variations in the fee for the use of water bodies in line with the justification provided in **Section III Financial part, it. 4.**

5.5 ANALYSIS OF THE EFFICIENCY OF THE COSTS FOR THE SEWERAGE SERVICE

Sewerage

With the exception of the costs for depreciation, remunerations and social contributions, the costs in real terms decrease as compared to 2015 as follows (in k BGN):

№	Costs by economic items	as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**	**532**	**530**	**530**	**530**	**530**	**530**
2	**Costs for hired services**	**1 468**	**1 513**	**1 487**	**1 450**	**1 412**	**1 373**
3	Taxes and charges	*40*	*40*	*41*	*41*	*41*	*41*
4	**Other expenses**	**62**	**109**	**108**	**106**	**104**	**103**
5	**total expenditure**	**2 103**	**2 191**	**2 165**	**2 126**	**2 087**	**2 046**
6	Variation compared to 2015		89	63	23	-15	-56

Variation by cost items:

№	Variation of costs by economic items compared to the reported 2015	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**		**-2**	**-2**	**-2**	**-2**	**-2**
2	**Costs for external services**		**44**	**19**	**-19**	**-56**	**-95**
3	Taxes and charges		*0*	*1*	*1*	*1*	*1*
4	**Other expenses**		**47**	**45**	**44**	**42**	**40**
5	Variation compared to		89	63	23	-15	-56

	2015.						

Costs for materials

The main reasons for the achieved efficiency are:

- *Costs for electricity:* price effect from the forecast of the costs under the effective prices at the time of developing this business plan under the conditions of prices for supply at a free market. Detailed information is provided below in **Section III. Financial part, it. 4**;

Costs for hired services

The main reasons for the achieved efficiency in 2019 - 2021 are:

- *Costs for repair*: after 2018 the planned by the Company increase in the share of repairs performed with internal resources and decrease in the amount of the jobs assigned to contractors;
- *Costs for insurances*: price effect under the effective prices as per the last renewed contracts, plus an effect from the reclassification resulting from the costs unrecognized in conformity with the Instructions on the prices for additional health insurance in the period 2017 – 2021.

Other costs

A combined effect from the decrease in the annual costs with regard to ISPA as a result of the updated repayment schedule (Detailed information is provided below in **Section III. Financial part, it. 4**) and an increase as a result of an adjustment of one-off reversed cost in 2015.

5.6 ANALYSIS OF THE EFFICIENCY OF THE COSTS FOR THE WASTEWATER TREATMENT SERVICE

Wastewater treatment

With the exception of the costs for depreciation, remunerations and social contributions, the costs in real terms decrease as compared to 2015 as follows (in k BGN):

№	Costs for economic items	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**	**4 079**	**4 493**	**4 501**	**4 477**	**4 477**	**4 477**
2	**Costs for hired services**	**2 860**	**3 033**	**3 031**	**3 023**	**3 014**	**3 002**
3	Taxes and charges	*507*	*517*	*517*	*518*	*519*	*1 741*

4	**Other expenses**	**356**	**333**	**328**	**322**	**317**	**312**
5	**total expenditure**	**7 802**	**8 376**	**8 377**	**8 341**	**8 327**	**9 531**
6	Variation compared to 2015 -total		574	575	539	525	1 729

Variation as compared to 2015:

№	Costs for economic items	Actuals as at 31.12.2015	Estimate 2017	Estimate 2018	Estimate 2019	Estimate 2020	Estimate 2021
1	**Costs for materials**		**414**	**422**	**398**	**398**	**398**
2	**Costs for hired services**		**173**	**170**	**162**	**153**	**142**
3	Taxes and charges		*10*	*-11*	*-12*	*-12*	*1 234*
4	Variation compared to 2015.		**-22**	**-28**	**-33**	**-39**	**-44**
5	Variation compared to 2015 - total		574	575	539	525	1 729

Costs for materials

The increases in the costs are mainly due to the price effect from the costs for coagulants in line with the information provided below in **Section III. Financial part, it. 4 Cost analysis,** and vice versa – there is net saving in the cost for flocculants of -60 k BGN as compared to 2015. A slight increase in the costs is planned in the electricity for process needs in line with the detailed justification below in **Section III**. **Financial part, it. 4.** An increase is planned in the costs for other materials – for quicklime for sludge liming.

Costs for hired services

The variations are due to the combined effect of:

- *Increased costs for utilization (sludge transportation) in line with the justification in **Section III. Financial part, it. 4.3.2**;*
- *Decrease in the costs for operative repair;*
- *Costs for insurances*: decrease because of price effect under the effective prices as per the last renewed contracts, plus an effect from the reclassification resulting from the costs unrecognized in conformity with the Instructions on the prices for additional health insurance in the period 2017 – 2021.

Taxes and fees

For the period 2017 – 2021 slight increase of the costs is a result of the corrected variation of the billed volumes and their effect on the discharge fee, as in 2021 in increases considerably in line with the Decree of Council of Ministers No.377/30.12.2011, art.12 and according to the provided additional justification in **Section III. Financial part, it. 4.**

Other costs

The decrease in the category 'Other costs' is due to a decrease in the annual cost in ISPA with regard to the updated repayment schedule (Detailed information is given below in **Section III. Financial part, it. 4**).

5.7. ANALYSIS OF EFFECTIVENESS OF STAFF REGARDING WATER SUPPLY SERVICE

The indicator KPI15a is the ratio between the number of staff responsible for water supply and the number of the WSCs. The staff is distributed as it is described in the Ordinance. For the purpose of the forecast the number of staff is taken from the staffing plan and when it comes to accountability it will be made on the basis of the equivalent full employment with correcting positive and negative differences, which will lead to a deviation from the estimated values. Furthermore, there will be a difference from the fact that the established long term levels are calculated based on staff data without the number of employees responsible for the non-potable water being taken in account and positive and negative differences being considered. The effectiveness is achieved by encouraging employees to use their paid annual leave during the year through an advance internal planning (without being legally required), as well as by limiting overtime.

The staff for 2015 has been distributed based on the distribution of salary costs made by the methodology of the Unified system for regulatory reporting. First the staff directly involved in the water services has been distributed. After that the administrative and supporting staff has been redistributed among the regulated services and non-regulated business and the part of staff for regulated services is distributed proportionally to the share of the direct costs for the relevant service, which was generated by this staff compared to the total amount of direct costs. The proportional shares by service are those used in the report for 2015.

The staff for 2016 is distributed by the methodology used for the distribution of staff in 2015. The higher amounts are due to the additional number of employees planned in 2016 in the sectors for servicing customers and the ones dealing with the quality of the supplied service and the referring of some of the redistributed staff to non-regulated business.

The staff distribution for the regulatory period is done according to the instructions for Business Plan 2017-2021. First were distributed the employees directly responsible for the regulated and non-regulated business. Then the staff for the non-regulated business that is part of the redistributed administrative and support staff is separated using the ratio of costs. For the rest of the administrative and

support staff is used the instruction for distribution by services. Because of the different methodologies and instruction for the preparation of BP 2016 and BP 2017-2021 there are slight differences in the shares distributed by services, which in combination with the different rates used in BP 2016 and report 2015, also lead to different ratio between the staff responsible for water supply and the one responsible for waste water treatment. Moreover, in addition to the requested employees for the customer service sector for 2016 are added employees that will work on the process of quality certification and its subsequent maintenance, as well as employees who will be engaged in the maintenance of the implemented customer service systems, quality management and the internal development of applications which will facilitate the work in the company. These employees fall within the scope of activities for which costs are being redistributed.

Sofiyska Voda AD presented data about the number of employees on Full-Time Equivalent (FTE) as an additional information with letter Outgoing № СВ-1677/07.09.2016.

The same have been obtained as the number of persons in the establishment plan has been corrected with the number of days of leave.

№	Name	Regulated business																						
		Supply water							Sewerage							Treatment								
		2015	2016	2017	2018	2019	2020	2021	2015	2016	2017	2018	2019	2020	2021	2015	2016	2017	2018	2019	2020	2021		
1	**Number of employees**																							
1.1.	Average number of employees, employment contract	689	717	674	676	676	676	677	99	106	136	136	136	136	136	187	184	200	200	200	201	201		
1.2.	Average number of persons without employment contract	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1.3.	Number of persons as per the approved staff establishment plan	725	754	709	711	711	711	712	111	118	152	152	152	152	152	211	208	226	226	226	227	227		
1.4.	**Total number of employed persons, in full time equivalent**	**690**	**718**	**675**	**677**	**677**	**677**	**678**	**99**	**106**	**136**	**136**	**136**	**136**	**136**	**187**	**184**	**200**	**200**	**200**	**201**	**201**		

Non-regulated business							Water supply to other WSS operator							Non-potable water supply							TOTAL						
2015	2016	2017	2018	2019	2020	2021	2015	2016	2017	2018 г.	2019	2020	2021	2015	2016	2017	2018	2019	2020	2021	2015	2016	2017	2018	2019	2020	2021
52	40	40	40	40	40	40	5	5	5	5	5	5	5	31	29	29	29	29	29	29	1063	1081	1084	1086	1086	1087	1088
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
58	45	45	45	45	45	45	6	6	6	6	6	6	6	33	31	31	31	31	31	31	1144	1162	1169	1171	1171	1172	1173
52	**40**	**40**	**40**	**40**	**40**	**40**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**31**	**29**	**29**	**29**	**29**	**29**	**29**	**1064**	**1082**	**1085**	**1087**	**1087**	**1088**	**1089**

Due to the ascertained omission in the calculation of the number of FTE employees, the same are recalculated according to it. 3 d from the Instructions to the

Ordinance on regulation of the quality of the WSS services, namely Personnel in Full Time Equivalent (FTE) shall be determined as the number of the part-time personnel shall be adjusted to its equivalent number of full-time personnel for an 8-hour work day and a 40-hour work week. The personnel, which is indirectly involved in providing of a specific activity or services (personnel involved in administrative and support activity) shall be allocated to the respective activities based on the ratio between the number of personnel, which is directly involved in providing the respective service, and the total number of the personnel. The FTE value shall be adjusted in terms of:

(i) Positive corrections which increase the employment rate such as:

- Overtime;
- Temporary personnel and others;

(ii) Negative corrections which decrease the employment rate such as:

- Leaves;
- Sick leaves;

The terms *Staff establishment plan (number of employees), Average staff establishment plan, Full-time employed staff, Part-time employed staff* and *Equivalent to the full-time employed persons* shall have the meaning as per art.3 of the methodology for the calculations for the staff establishment plan and the average staff establishment plan approved by the National Statistical Institute with the Order No. РД 07-21/31.01.2007 of the Chair of the NSI.

In this respect, the number of FTE employees is corrected additionally with the number of days of absences due to sickness. The same are calculated by taking the average number of absent days due to sickness for the last three years, distributed by services. The forecast is made by correcting the number of FTE employees with the calculated value for each of the activities. The value is equal for the entire period of the business plan; for water supply it is on average 10,771 days on sick leave for the year, for sewerage 2,658 days on sick leave for the year and for wastewater treatment - 3,960 days.

By using these recalculated data about the number of FTE employees, the company will recalculated also the indicators for personnel efficiency (Report 3) thus achieving the set individual KPI levels.

In relation to it. 5.5 of EWRC letter, Incoming Ref. №СВ-1677/19.08.2016, the Company presented additional information regarding the impact of the new Customer Information System on the structure and number of the staff by making the following specifications:

1. The implementation of the system highly automatized a big part of the billing processes and this was reflected in the current number of these teams. At the end of 2014, the Billing and Corrections teams counted 59 employees, of which: 44 in Billing, 13 in Corrections and 2 in Payment Maintenance. At 31st of July 2016, the department counts 48 employees, of which: 32 in billing, 13 in corrections and 3 in payments maintenance. In total, 11 employees were not necessary anymore to perform billing or corrections tasks.

2. These employees were internally transferred in other departments, where additional workforce was needed, as follows:

- One employee in Non Regulated Business Department;
- Ten employees in Network Management Directorate, where a new team was created, *Data Analysis and Processing*. This team performs validations of readings, data entry from field activities, as well as reporting and monitoring of activities. The validation of readings is a part of the reading process, preparing data for the billing, which was not performed before and it is an additional control which we implemented due to the new customer information system: based on predefined plausibility criteria of readings (e.g. history of consumption, maximum and minimum thresholds etc.) the system generates a list of readings presumed implausible. As result of it data are additionally checked, before entering the billing process. This control is meant to detect possible mistakes in reading and avoid customer complaints.

3. The difference compared to the initial number of 18 people results from the fact that when this forecast was requested to be provided in March 2014, the project was in a very early stage, which allowed only rough estimation of the future workload with the new system.

4. Following internal reorganization, from October 2015, the Correction team was integrated in the Billing Department (before it was in the Customer Services) and most of the employees were trained to perform both types of tasks. This organization provides increased flexibility allowing to overcome potential peaks in the two types of activities. Also, with the current number of staff, we can provide a faster resolution time to customer requests related to opening, or changing of accounts, as well as invoice corrections.

In conclusion, we can state that:

- ✓ Due to the implementation of the new customer information system, the number of employees in billing was reduced, but no redundancies were necessary, since there were needs of additional employees in other departments
- ✓ The anticipated savings related to staff were actually achieved by avoiding additional expenses for the hiring of additional people needed in other departments.
- ✓ The existing number of staff in the billing and corrections team, as well as the newly implemented organization allows the proper handling of these processes, covers potential activity risks leading to increase in the working tasks and allows a faster resolution of customer requests related to corrections of accounts or invoices.

5.8. ANALYSIS OF EFFECTIVENESS OF STAFF REGARDING SEWERAGE AND TREATMENT

The indicator KPI15b is the ratio between the number of staff responsible for the sewerage and treatment of water and the number of the SSCs. The staff is distributed as it is described in the Ordinance. For the purpose of the forecast the number of staff is taken from the staffing plan and when it comes to accountability it will be made on the basis of the equivalent full employment with correcting positive and negative differences, which will lead to a deviation from the estimated values. Furthermore, there will be a difference due to the fact that the established long term levels are calculated based on staff data without taking into consideration the positive and negative differences. The effectiveness is achieved by encouraging employees to use their paid annual leave during the year through an advance internal planning (without being legally required), as well as by limiting overtime.

5.9. ANALYSIS OF THE DEBT COLLECTION

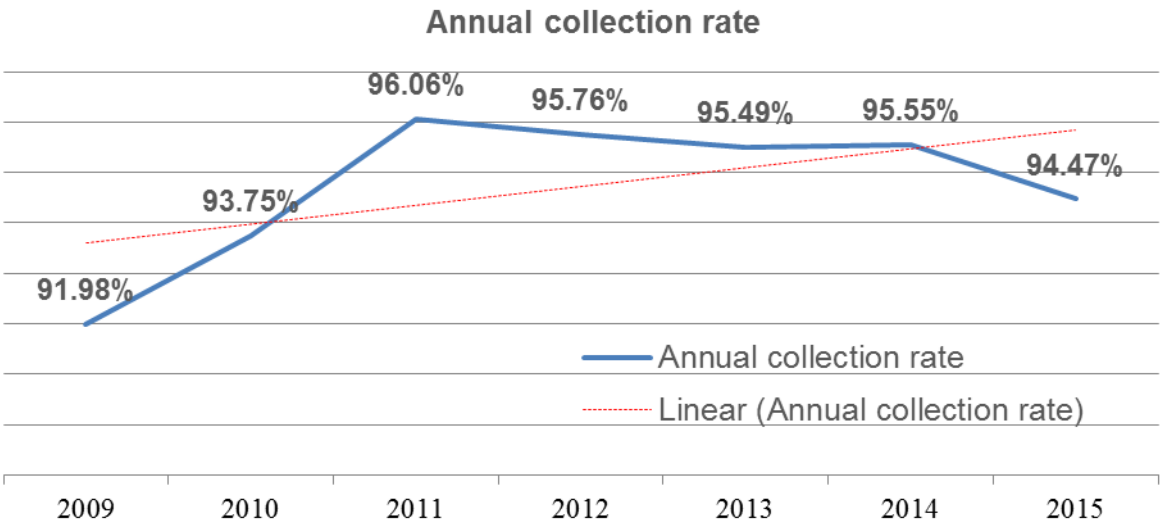
The activities for collection of debts are one of the most challenging and the highest priorities, which are characterized with high level of impact on the working capital and the revenues of the company. The multiple macro and micro – economic, political and social factors affect significantly the execution of these activities, as Debt collection department continuously aims to improve its flexibility and fast adaptation to the dynamic environment in which it operates. Among the main macro-economic events, which affect more significantly the collection were the slow economic growth, which affected the purchasing power and the income of the population, the held local and parliamentary elections, which by tradition are connected with uncertainty and increasing of the savings on behalf of the citizens. The public and mass media events against monopolists and the companies, providing utility services additionally affected negatively the process for decreasing of the not collected debts of Sofiyska Voda JSC . Also a main negative aspect at debt collection is that the water bills together with the ones for the supply of heat have a low priority for payment among the population due to the difficult disconnection of the services.

As per the last data from the Association of the Collection Agencies in Bulgaria (ACAB) in 2015 the average not collected amount of the Bulgarians is increasing with over 50% on annual basis. And despite the fact that the main weight (63%) in these data are the debts to banks and financial institutions, the same tendency is observed also in the debts of the company. In 2015 the average number of debtors is kept at the same levels as in 2014, while the average amount of the debt is increasing with 11% on annual basis (from 465.38 BGN in 2014 to 515.40 BGN in 2015).

In March 2015 was implemented the new information system for complex services and billing of the customers – SAP. The system consolidates business processes which up to this moment were processed by several different databases and software. In the new system specially was developed a module for debt

collection, including the organization of the whole activity for phone negotiations with customers and on address. The process of implementation, connected with the migration of the big volume of data from the rest of the systems, as well as the period for improving of the processes affected negatively the rhythm and the regularity in the activities for debt collection in in the period March – April 2015, when were registered also the lowest levels of collection over the year. Despite that the period for synchronization and fixing of the technical bugs due to the implementation of SAP was overcome relatively fast. Thanks to the efforts of the internal teams as well the rhythm in the activities for collection was fully restored and for the period until the end of the year (May - December 2015) the registered collection was 99.54% (compared to 96.75% in 2014 and 96.44 in 2013). As a result of the specified reasons and despite the fast restoration of the collection the annual collection rate for 2015 is 94.47%, with -1.1% lower than the one in 2014 (95.55%).

The tendencies on the annual collection are presented in the below chart:



Note: The collection rate is calculated as the ratio between the total amounts collected and the total amounts invoiced for the year.

The trend of recent years shows an improvement in this indicator, which continues to the present.

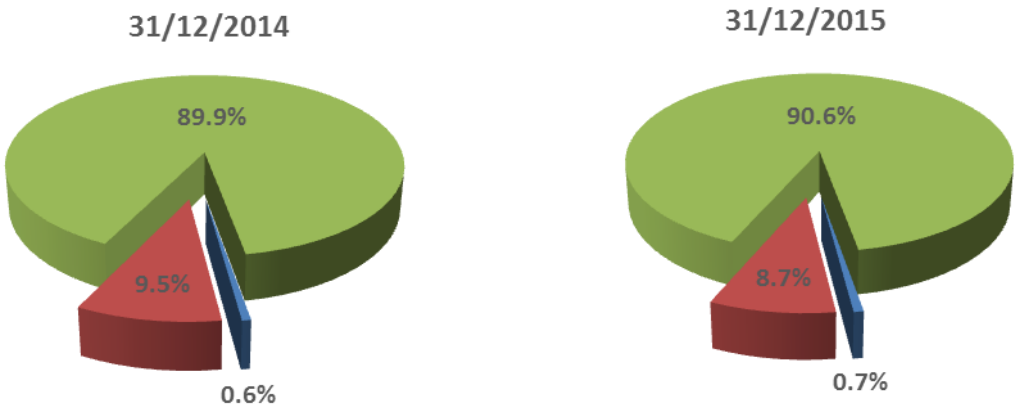
The outstanding debt at the end of 2015 is to the amount of BGN 83,205,780. The structural analysis of the indications shows that 16% or 13.324 M BGN represent generated interests from the delay or lack of payments from customers of the Company.

The total amount of the outstanding debt as of the end of 2015 has registered an increase with 7.817 M BGN or 10.37% compared to the end of 2014.

The detailed information for the amount, the age and the type of customers, which accumulate debt, is presented in the table and the graphs below:

Age of debt (days)	Total amount (BGN) as at 31/12/2014	Total amount (BGN) as at 31/12/2015	Annual variation (%)	Weights of the age groups as at 31/12/2015
0-30	3 057 789	3 161 215	3%	4%
31-360	18 679 651	17 584 034	-6%	21%
361-720	14 126 064	13 217 104	-6%	16%
721-1080	10 853 330	11 668 646	8%	14%
1081-1440	9 238 471	9 791 092	6%	12%
1441-1800	7 334 060	8 551 501	17%	10%
>1800	12 099 627	19 232 189	59%	23%
Total	**75 388 992**	**83 205 780**	**10,37%**	**100%**

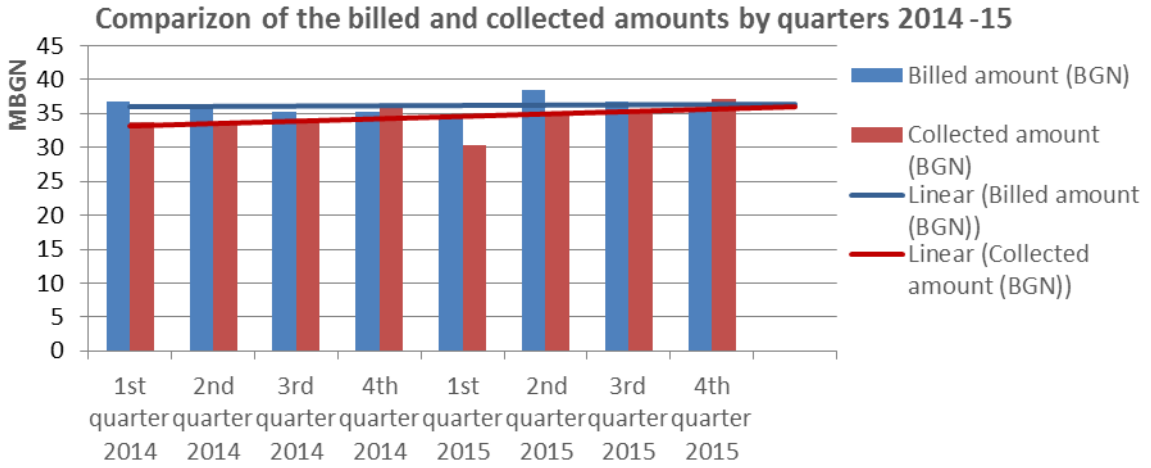
Distribution of debt according to the type of customers



- Households
- Commercial organisations
- Budget organisations

A more detailed analysis also shows tendency for increasing of the collection in the last 8 quarters of 2014 and 2015 (the chart below) due to the consistent approach in the collection of debts:

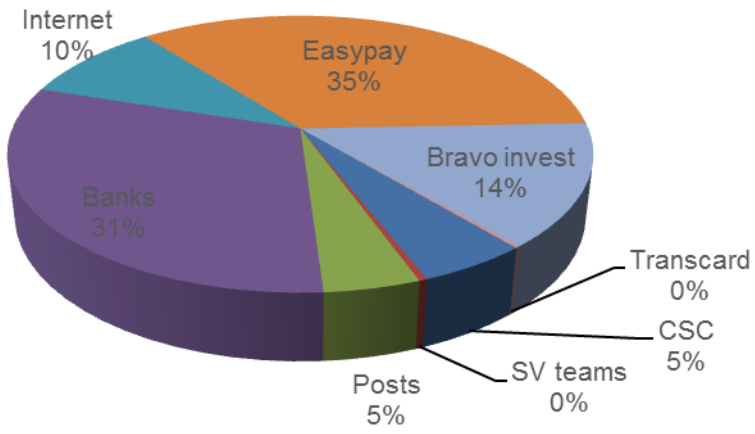
- Increase of the number of door-to-door visits of domestic and commercial customers and key accounts by 7.6% (on an annual basis);
- Keeping high number of phone negotiations (296,018 in 2015 and 297,993 in 2014), as well as increased effectiveness of this channel in terms of collection – almost 21.0% debt collection by this channel in 2015 against 18.0% in 2014;
- Improved synchrony and consistency in the rotation of the various actions on the debt collection;
- Better control and analysis of the results owing to the new system and the variety of reports, which it provides



Regarding the channels for payment of the debts to Sofiyska Voda JSC the percentage distribution of the revenue is as follows:

Payment channels	2014	2015	Difference%
CSC	7 241 620	7 125 568	-1,60%
SV teams	627 295	526 463	-16,08%
Posts	7 266 307	6 179 431	-14,96%
Banks	42 825 274	42 669 493	-0,36%
Internet	11 810 938	12 922 769	9,41%
Easy Pay	46 869 684	48 082 367	2,59%
Bravo Invest	20 210 872	19 653 677	-2,76%
Transcard	307 570	305 560	-0,65%

Distribution of the weight by payment channels



During the past 2015 SV performed the following activities and actions in order to increase debt collection:

- *Reminder letters*

5 campaigns were held in 2015 and 210,205 reminder letters and invitations for out-of-court settlement of the debts of the customers with outstanding debts were sent.

- *Negotiations with individual customers 'door-to-door'*

In 2015 were visited 49,739 addresses of customers with outstanding debts. The total collection rate achieved as result of these visits is 13.72 %, which is less than in 2014, but the main reason is the considerably higher outstanding debt. On the other hand the total registered payments from customers, which the teams visited at an address has increased by 3.4%

Year	2014	2015	Annual difference %
Visited addresses	46 213	49 739	7,6%
Debt (BGN)	33 967 488	37 939 713	11,7%
Paid sum (BGN)	5 036 943	5 207 168	3,4%
Debt Collection	14,83%	13,72%	-7,4%

The number of door-to-door visits was by 7.6 % higher in 2015 as compared to 2014.

The cash collected during door-to-door visits has dropped in 2015 (BGN 526,463) but despite it ranks second in terms of amount after the record 2014 (627,295) of the previous 5 years.

- *Negotiations with individual customers by phone calls*

In 2015, 296,018 phone calls were made to request payment of outstanding debts as compared to 297,993 in 2014 (a drop by – 0.66%). Despite the drop in the number of conversations, mostly because of the delay due to the implementation of SAP, the effectiveness of this channel for debt collection is significantly improved. The summarized results from the activity are the following:

Year	2014	2015	Annual difference (%)
Call made	297 993	296 018	-0,7%
Debt (BGN)	48 498 665	49 544 180	2,2%
Paid sum (BGN)	8 731 751	10 289 245	17,8%
Debt Collection	18,00%	20,77%	15,4%

- *Deferred Payment Agreement*

Sofiyska Voda JSC provides to its customers with liquidity and financial difficulties signing of deferred payment agreements (DPA) of the overdue amounts, as this may be done in the CSC or during the door – to – door visits of the teams.

In 2015 by this indicator were registered the most significant decreases:

Year	2014	2015	Annual variation %
Number of signed DPA	4 244	3 248	-23.5%
Total deferred amount (BGN)	4 354 479	3 783 820	-13.1%
Paid amount in cash as initial installment (BGN)	1 097 500	767 996	-30.0%
Collection	25.20%	20.30%	-19.5%

- *Debt Collection Agencies*

In 2015 Sofiyska Voda JSC continued to work with 2 collection agencies. In the table below are presented the results regarding the collection for the last year:

	Law office Popov and partners			Finance Pro Collect Ltd.		
Period	**Debt**	**Collected**	**Collection rate**	**Debt**	**Collected**	**Collection rate**
2015-01	6 873 882	122 148	1,8%	13 903 757	239 781	1,7%
2015-02	8 793 717	143 084	1,6%	14 505 510	216 742	1,5%
2015-03	8 793 717	133 242	1,5%	14 505 510	215 493	1,5%
2015-04	8 793 717	111 149	1,3%	14 505 510	150 727	1,0%
2015-05	8 793 717	104 031	1,2%	14 505 510	136 748	0,9%
2015-06	9 503 515	118 548	1,2%	15 171 104	163 964	1,1%
2015-07	9 503 515	153 814	1,6%	15 171 104	152 165	1,0%
2015-08	9 503 515	105 663	1,1%	15 171 104	224 636	1,5%
2015-09	9 503 515	118 812	1,3%	15 171 104	203 130	1,3%
2015-10	10 631 304	140 690	1,3%	16 404 669	213 802	1,3%
2015-11	10 631 304	127 345	1,2%	16 404 669	180 912	1,1%
2015-12	10 631 304	148 173	1,4%	16 404 669	181 724	1,1%
Total		**1 526 699**	**16,5%**		**2 279 824**	**15,1%**

- *Service of Key Customers*

Key Accounts team from Debt collection department services over 3 500 customers' accounts, specified by economic and social categories including: sites with monthly consumption above 600m^3, hospitals and health facilities, schools and kindergartens, ministries, embassies and sites of regional and national significance.

The tables below show monthly collection at key accounts in 2014 and 2015:

2014	Billed amount	Collected amount	% Collection
January	2 572 480	2 086 446	81,11%

2015	Billed amount	Collected amount	% Collection
January	2 449 254	1 381 720	56,41%

February	2 515 069	2 531 961	100,67%	February	2 398 339	2 748 499	114,60%
Mart	2 334 974	2 140 986	91,69%	Mart	1 437 856	1 270 452	88,36%
April	2 320 513	2 400 604	103,45%	April	2 586 864	1 663 210	64,29%
May	2 340 653	1 889 794	80,74%	May	2 334 053	2 271 956	97,34%
June	2 089 730	1 914 458	91,61%	June	2 159 117	2 187 325	101,31%
July	2 283 048	2 013 476	88,19%	July	2 351 045	2 422 074	103,02%
August	2 120 600	2 327 963	109,78%	August	2 262 931	2 222 208	98,20%
Septembe r	2 159 925	2 119 378	98,12%	Septemb er	2 282 783	2 564 839	112,36%
October	2 169 754	2 472 766	113,97%	October	2 246 266	2 624 186	116,82%
November	2 296 409	2 153 089	93,76%	Novembe r	2 313 616	2 329 933	100,71%
December	2 132 941	3 246 162	152,19%	Decembe r	2 285 532	3 345 786	146,39%
Total	**27 336 095**	**27 297 083**	**99,86%**	**Total**	**27 107 654**	**27 032 187**	**99,72%**

- *Court actions, started against debtors of Sofiyska Voda JSC*

In 2015 were initiated new court actions against 3,144 debtors of the company, forming a total debt to amount of 8 651 213 BGN.

- *Information for the biggest debtors of Sofiyska Voda JSC*

The table below contains information for the biggest debtors of the company as of 31.12.2015:

Customer number	Name of customer	Municipality	Address	Current amount BGN	Outstanding debt BGN	Number of not paid invoices
1005002670	Vrana EAD	Pancharevo	Lozen 1797 Sofia Bul. Tsarigradsko shosse 387	982 084	968 074	64
1004062067	Revenue meter	Iskar	Sofia 1592 Sofia Druzhba 1 bl.5 ent.A.B.V	317 598	317 598	78
1003072477	Revenue meter	Kremikovtsi	Sofia 1849 Sofia Kremikovtsi bl.101 ent B	265 421	261 864	96
1002013854	Revenue meter	Vazrazhdane	Sofia 1303 Sofia Zona B-5, bl.9 ent.A,B	237 464	237 464	49
1003070653	Revenue meter	Kremikovtsi	Sofia 1870 Sofia Botunets bl.1, ent.A	165 698	164 514	96
1004008932	Revenue meter	Lyulin	Sofia 1336 Sofia Lyulin 6 bl. 630, ent.A,B	161 506	159 938	73
1005186707	Regional Administration – Sofia district	Studentski	Group customer with several addresses	160 647	158 951	111
1004062070	Revenue meter	Iskar	Sofia 1592 Sofia Druzhba 1 bl.6 ent. G,D	146 091	146 091	79
1004009572	Revenue meter	Lyulin	Sofia 1336 Sofia Lyulin 2 bl..215,ent.B	133 583	131 557	141
1004000436	MoS Lyulin bl.021	Lyulin	Sofia 1336 Sofia Lyulin	131 993	131 993	42

	ent. B		1 bl.021 ent.B			
1003098007	Revenue meter	Krasno selo	Sofia 1612 Sofia Hipodruma Tsar Boris III blvd, build.: 21	127 957	127 957	69
1003072478	Revenue meter	Kremikovtsi	Sofia 1849 Sofia Kremikovtsi	122 757	122 757	72
1002041459	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia, Fakulteta Rishki prohod str., bl.7	115 125	114 042	118
1004010166	Revenue meter	Lyulin	Sofia 1324 Sofia Lyulin 8 bl.802, ent.A,B,	112 187	110 442	92
1002041461	Revenue meter	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.10	108 657	107 127	95
1002041464	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.6	100 638	99 303	94
1003070676	Revenue meter	Kremikovtsi	Sofia 1870 Sofia Botunets bl.8, ent.B	99 922	99 025	96
1002041457	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.3	95 662	94 501	93
1002041460	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.8	95 404	93 996	95
1003072479	Revenue meter	Kremikovtsi	Sofia 1849 Sofia Kremikovtsi bl.103, ent.A	94 946	94 946	76
1002041462	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.11	94 037	92 922	93
1003098008	Revenue meter	Krasno selo	Sofia 1612 Sofia Hipodruma Tsar Boris III blvd, bl.19 ABV	93 945	93 945	43
1004004098	Revenue meter	Lyulin	Sofia 1324 Sofia Lyulin 9 bl..916, ent.V	90 441	89 285	81
1002041456	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.1	90 339	89 065	93
1002041458	Revenue meter - hospice	Krasna polyana	Sofia 1373 Sofia Fakulteta Rishki prohod str, bl.5	88 364	87 041	92
			TOTAL:	**4 232 464**	**4 194 398**	**2 131**

From the table it is obvious that the biggest debt is generated from customers, population type, followed by commercial and budget organizations. The biggest debtor of Sofiyska Voda JSC is Vrana JSC. At the moment, a second trial is under way between the two companies in connection with accumulated debts. After the first trial the court ruled against Sofiyska Voda JSC, which led to write-off of unrecognized receivable in April 2015 to the amount of 559 385 BGN from principal for the period up to September 2010 and respectively an interest to the amount of 311, 864 BGN.

The number of biggest debtors of the company, which generates 10% from the total amount of the debt, is 120.

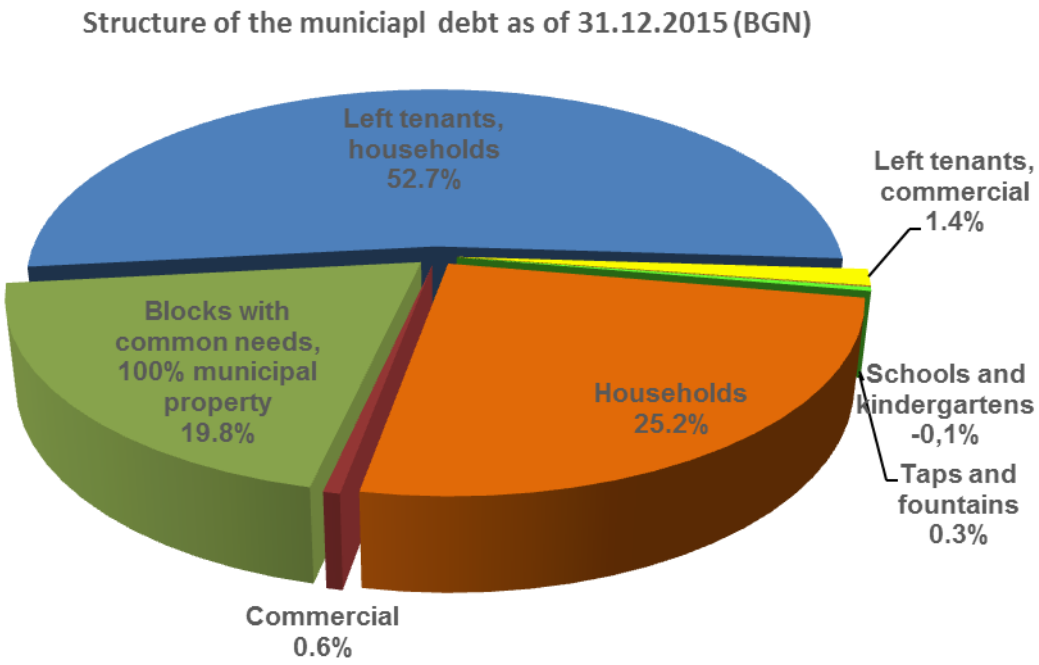
- *The debts, accumulated from Municipality of Sofia and tenants in municipal property*

One of the main problems the company faces in collection of overdue receivables is municipal tenants and properties. In the past 2015 Sofiyska Voda JSC continued to send monthly reports to all regions of Sofia Municipality for the debts in the municipal properties.

The total generated debt as of 31.12.2015 is to the amount of 6 697 359 BGN, as 97% from them (6 491 251 BGN) are overdue. On annual basis the total debt has registered an increase with 636 443 BGN or 10.87% compared to 31.12.2014.

The table below contains detailed information regarding the accumulated debts at the end of 2014 and at the end of 2015.

Type of municipal tenants and properties	Debt as of 31.12. 2014 (BGN)	Debt as of 31.12. 2015 (BGN)	Variation (BGN)	Variation (%)
Households	3 392 660	1 635 646	-1 757 014	-51,79%
Commercial	41 655	36 171	-5 484	-13,16%
Blocks with common needs 100% municipal owned	1 146 722	1 286 528	139 806	12,19%
Left tenants, households	1 348 321	3 427 938	2 079 617	154,24%
Left tenants, commercial	57 331	88 081	30 750	53,64%
Schools and kindergartens	-157 264	-4 776	152 488	3192,95%
Taps and fountains	25 383	21 664	-3 719	-14,65%
Total	**5 854 808**	**6 491 251**	**636 443**	**10,87%**



And in 2015 the main focus of Debt Collection Dept. was put on debt collection up to 3 years to prevent debt accumulation, which will be very difficult to collect due to the 3-year limitation period of the receivables for utility services.

Promoting different ways and channels of payment which considerably improve the immediate collection and cash flow (electronic payment, direct debit through ATMs) are other actions that the company implemented in 2015 and plans to continue in 2016. For example, and in connection with implementation of the new system, all contracts with payment service providers were countersigned and / or annexed with added clauses to expand cooperation (to provide additional channels for cash payments through ATMs).

In this respect, in 2015 the company provided new channels for payment and convenience to its customers through ATMs of UniCredit Bulbank, DSK bank, Raiffeisen Bank SA and Eurobank Bulgaria AD, as with the last three will be technically covered by April 2016.

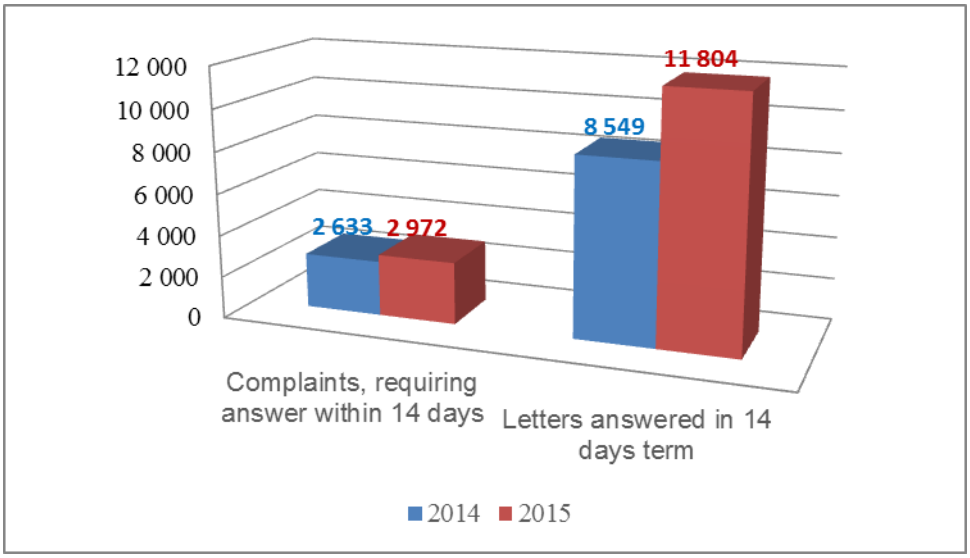
Also, thanks to newly implemented system the speed and time for processing of payments has been significantly improved. Outgoing files with debts as well as with incoming collected amounts were unified with all suppliers, and the payments from the customers at the end of the day are distributed in customer accounts in the next morning.

5.10. ANALYSIS OF THE TERM FOR REPLY OF WRITTEN COMPLAINTS OF CUSTOMERS

The company strictly complies with requirements of Art. 55 (2) of the current General Terms and Conditions for response to received letters within 14 calendar days.

In 2015, the Company received a total of 11 804 letters of a different nature and topic from customers which have been answered within the statutory deadline.

The distribution of received letters and complaints for 2015/2014, with regulated period for response in accordance with the General Terms and Conditions of Sofiyska Voda JSC is shown in the following chart:



It is evident from these data that the letters received in 2015 were with 38.07% more than in 2014. Despite this the increase in the number of complaints is only 12.88 % more compared to the same period an year earlier, which is less than the overall increase in the number of letters. Both trends can be explained by changes made since March 2015, when the new information system started.

In terms of total number of letters, the increase is mainly due to requests for additional information regarding new services and functionality in the customer information system which provides possibility for maintenance of structured information regarding customer status.

After the start of system the data which were migrated from the old information system in new, the customers with several properties with consumption were grouped under one customer number and different contracts and contract accounts for different sites (group customers). This opportunity led to increased interest from customers regarding requests for information, especially regarding the possibility of receiving a single invoice for all objects of consumption, with details of consumption in each site. Also the design of the invoice was changed including more detailed and accessible information for customers.

Increasing the number of complaints is due mainly to a temporary situation related to the implementation of the information system and delays in processing of customer requests for technical reasons accompanying the implementation of the system. The reasons are objective and typical for such complex projects as related to problems with the migration of data (lack of data or inconsistency in several previous systems), problems with invoices of some customers, delaying the sync of the website with new system therefore certain functions of the website was not available for customers in the initial period, slower processing of data of client requests also lead to a further increase in the number of complaints.

Based on the prepared monthly analysis of customer complaints, measures are taken at various levels in the company to improve processes and increase the quality of services offered.

The following table shows the distribution of complaints according to their reason in 2015:

Reason of the complaints	Number of received complaints	%
High consumption of Common needs	351	12%
Disagreement with billed water volumes	1 869	63%
Refusal to connect to the water and sewer service connections	0	0%
Interrupted water supply (planned and emergency interruptions, low and high pressure)	118	4%
Flooding form the sewerage network	8	0%
Charging of services which are not provided by the WSSoperator	0	0%
Low water quality of the potable water	11	0%
Other (technical and administrative services, imposing to the customers the obligation for buying of water meters for the HWC, not executed reading of the meter, lack of mandatory requisites in the invoice, etc.)	615	21%
Total	2 972	100%

In 2015 are sent a total of 210 205 letters and invitations for voluntary payment of the debt formed to customers with overdue bills. Following this activity there is registered a growth of received letters relating to the established accounts as well as a higher proportion of objections relating to a request for review of obligations pursuant to Art. 111 "c" of the LOC or repayment in three years. The highest share of the analysis are complaints relating to individual customer accounts or "disagreement with the charged water quantity" - 63%.

In the past year an increase is observed in the number of complaints about billed water consumption for uninhabited properties due to misunderstanding or disagreement by our customers regarding compliance with Art. 40 (1) of the General Terms and Conditions for the provision of water and sewerage services to consumers, namely "Under submitted a reasoned written request from the customer the WSS operator may suspend the supply of potable water by sealing the stop valve before the meters for period specified in the application, in which case are submitted the indications when submission of the application".

351 or 12% of all complaints are related to high consumption of common needs .This reason includes all complaints from customers in condominium, who expressed their disagreement with the calculation and distribution of quantities of "common needs" in their individual accounts. To these customers it is explained in detail the principle of

distribution of "common needs", defined in the Ordinance № 4 of Ministry Of Regional Development, and is provided a report for formed debts in the condominium and in particular to the customer for the last reporting period.
Every written complaint registered in records management system of the Company is examined carefully by a team "Written correspondence" to Sofiyska Voda , and an individual solution is offered for each particular customer case.

In the case of found inaccuracy in meter reading or billing, in response to a customer complaint corrections are made and corrective actions are undertaken in instructions and processes to avoid such problems in the future.
For establishing the causes of "common needs" in each condominium, from which it is received a complaint to the Company are undertaken site inspections from team "Reactive field activity" and, if it is necessary are issued prescriptions to the customers. When complaints related to situations for which the Company is not responsible, are provided advices to customers, offered additional services (detection of leaks in internal networks) or flexible payment plans for customers who are experiencing financial difficulties.
In 2015, to 100% of written customer complaints was sent response within 14 calendar days, and for inquiries received through the website of the Company - within 24 hours.
The information system provides possibility for clearer definition of reasons for contact by customers and institutions for this purpose was developed one and unique catalog of reasons for each communication channel. This classified information helps us to group the customer interactions under one classification of contacts irrespective the communication channel and to focus on existing problems of customers, as it helps to improve the quality of services and the level of customer service.

In order to increase customer satisfaction and increase the control of the process at the end of 2015 the company launched a project to implement a Quality Management System in accordance with the standard ISO 9001: 2015 to the customer service processes, including processes covering the activities of the team "Written correspondence." In view of the implementation of the system the internal processes will be reviewed and improved, using the requirements of the standard, namely process approach, risk - based thinking, implementation of process for Managing on non-conformities with execution of corrective and preventive actions. Also quality objectives will be set and their follow up in time. All this within the main goal of the company to improve customer services and satisfaction.
In compliance with the approved business plan of the company for 2016, the forecast number of complaints is expected to be 2,782 but the realistic forecast for the calendar year is that their number would reach 3,415. As of January 2016 for reporting purposes in the monthly reports and analyses the entire correspondence is included - not only the letters from the end customers but also from institutions and this is the main reason for the increase of the number of registered letters and

complaints in particular. As a result from the performed analysis for the first 5 months of the year (number of complaints 1,342), the forecast growth rate for the calendar year 2016 for the number of complaints is that it would reach 3,415, comparable with 2,972 for 2015.
A lot of changes were made in the company including implementation of a system which gives us the opportunity to define the reasons for contact with our customers. After a conducted detailed analysis the reasons for contact were specified in separate catalogues by topics. This approach minimizes the possibility for omission during registration and in such a way we have the opportunity not only to indicate the issues but also to focus on their resolving and minimizing in future.
The used approach for analysis up to 31.12.2015 is on the basis of registration index in the document management system, Archimed. Considered as of 01.01.2016 the registration index in the Archimed system is informative and all reports are extracted from the customer information system SAP, in which are registered not only the written contacts with customers, but also the visits in the customer service centers and the telephone contacts in the call center. This way, the company can have an unified reporting for all communication channels with the customers and a 360 ° view on all customer interactions. Also each letter is considered in details before registering the main reason, request or complaint. The current system gives us the opportunity to extract directly reports for each registered letter with details and status.
The developed forecast model for the period 2017-2021 is based on the anticipated realistic number by the end of 2016 - 3,415 and in relation to this, as a result from the initiated actions and performed changes, the goal of the company in the long-haul is to achieve reduction of the number of the registered complaints by 25.62% in 2021 compared to 2016.
The forecast is calculated on the basis of reduction by 4% of the registered complaints in 2017 as opposed to 2016 and further decrease by 1% each year as opposed to the previous one.

5.11. ANALYSIS OF THE CONDITION OF THE REVENUE METERS, INCLUDING A PROGRAM FOR SUBSEQUENT CHECK OF THE DEVICES FOR COMMERCIAL MEASUREMENT (WATER METERS AT THE WATER SOURCES AND WATER METERS ON WATER SERVICE CONNECTIONS)

5.11.1. Current situation regarding the revenue meters

As at 31.12.2015 the revenue meters encompass 112 486 water supply points; there measurement should be done through a revenue meter for potable water used for commercial measurement.
The company measures and bills consumption under 102 958 water meters, as the difference versus the mentioned number, the consumption where it exists, is billed in

the way provided for in the legislation. Sofiyska Voda puts great efforts for the replacement of the faulty devices but the process is impeded due to the following circumstances and cases:

- Lack of constructed water meter shafts – as per the current legislation the water meter shafts are ownership of the Company customers and they should be constructed by them. Sofiyska Voda is not entitled to impose penalties or make the customers construct water meter shafts;
- Old and decayed water service connections – only after their replacement the water meter node can be installed. Every year the Company constructs around 300 water service connections. In view of the limited budget of the Company, the replacement of old and decayed water service connections is fulfilled stage by stage throughout the entire period of validity of the Business Plan;
- Not provided/refused access to the properties – in many cases the customers of the Company fail to provide access to their properties (mainly in the out-of-urban areas), which impedes the replacement of the revenue meters;
- the presence of uninhabited properties where in fact there is no water consumption and invoices are not issued

In 2015 are:

- made compliant with the metrological validity 14,715 water meters on the water service connections;
- 2,578 meters are checked by a laboratory authorized by the SAMTS, and from them 1,242 were returned to the network.

5.11.2. Schedule for the period 2016 – 2021 for execution of subsequent inspections of meters by the customers in compliance with the Law on measurements

Making water meters on the water service connections complaint with the metrological requirements

Schedule for implementation of subsequent inspection of water meters on water service connection in compliance with the Law on measurements:

Year	2015	2016	2017	2018	2019	2020	2021
Inspected and returned on the network water meters	1 242	1 800	1 800	1 800	1 800	1 800	1 800
Newly-installed meters	13 473	15 200	15 200	15 200	15 200	15 200	15 200
Total made complaint with the metrological requirements	14 715	17 000	17 000	17 000	17 000	17 000	17 000

The process of making the water meters on the WSC complaint with the metrological requirements is carried out as per a preliminary prepared schedule for subsequent inspections and installation of meters with initial inspection.

The schedule for the period of BP 2017-2021 is in accordance with the need at the end of the period, most of the meters on the WSCs with possibility for access and technical execution to be made complaint with the metrological validity.

The schedule for the period of BP 2017-2021 is in compliance with

- optimum efficiency of the use of the teams in accordance with the nature of the properties for which installation / replacement of meters should be made
- It is necessary at the end of the period, most of the meters on WSCs, where there is access and it is technically possible to be made complaint with the metrological requirements by ensuring the meeting of KPI12f *Efficiency of the metrological compliance of the revenue meters*, but not lower than the specific individually set target.

Year	Nos. with metrological compliance expiring over the year	Expected number of meters made complaint with the metrological requirements	Total number compliant with the metrological requirements
2015	8 226	14 715	82 332
2016	9 452	17 000	89 000
2017	8 186	17 000	95 400
2018	18 558	17 000	93 900
2019	20 831	17 000	90 000
2020	17 111	17 000	90 000
2021	14 414	17 000	92 500

Inspection water meters

Year	2015	2016	2017	2018	2019	2020	2021
Inspected meters	2 578	3 000	2 500	2 500	2 500	2 500	2 500

It is necessary to point out that not all meters on WSC at the expiry of the metrological validity are inspected in authorized laboratories due to:

- Economic reasons – for the small diameters the cost of an installed water meter with initial inspection is less than the dismounting, inspection and possible subsequent installing.

- Technical reasons – there are water meters on the network which do not meet the technical requirements:
    - blocked / not functioning;
    - more than one subsequent inspection – decreased sensitivity at measuring;
    - high measured consumption – expired service life;
    - removed for different reasons.

Which are not inspected, but are replaced directly by new ones directly and the aim is to cover as accurately as possible the water volumes passing through the devices

5.11.3 Current condition of the water meters on the water sources

As at 31.12.2015 are operational 36 nos of meter, installed at the inlet of the water systems including water meters at the point of supply to a settlement to another operator. They are distributed as follows:

- **WS Beli Iskar** – Water sources – 8 nos., water meters – 17 nos.;
- **WS Sofia** – water sources – 10 nos., water meters – 14 nos.;
- **WS Non-potable water**– water source– 1 nos., water meter – 1 nos.;
- **WS Bozhurishte** – water meters – 4 nos.

Only one of the water sources is not measured *Pasha Bunar* catchment point for which is supplied less than 0.01% of the total volumes for WS Sofia. It supplies with water sites in Vitosha National Park. It is planned to construct a water meter shaft despite its location at a mountain areas, which are difficult to access

All devices meet the requirements of the State Agency for Metrological and Technical Surveillance (SAMTS) and the Basin Directorate Danube Region and are kept complaint with the legal provisions. In 2015 metrological inspection was made of 12 meters and in 2016 such is to be made of 17 nos.

5.11.4 Schedule over the period 2016 – 2021 for implementation of subsequent inspection of the meters on the water sources as per the Law on measurements.

Schedule for implementation of subsequent metrological inspections

Year	2015	2016	2017	2018	2019	2020	2021
Number of meters, subject to metrological inspection	12	17	19	9	21	14	9

5.12 PROGRAM FOR IMPROVEMENT OF COMPANY EFFICIENCY

Energy efficiency is managed:

As per of the Energy Efficiency Act, the Company being an owner of industrial systems with annual consumption exceeding 3000 MWh is obliged to manage energy efficiency:

1. Annual preparation of plans and programs for increase of energy efficiency;
2. Implementing measures envisaged in the plans and programs under item 1;
3. Providing information to Sustainable Development Energy Agency about the effect of the implemented measures and the expected effect from the implementation of the measures envisaged in the plans and programs under item 1;
4. Defining at least one official in whose job description the implementation of the obligations under item 1-3 is included;
5. Regular preparation (at least once a year) of analyses for the general and specific energy consumption;
6. Annual reports on the management of the energy efficiency which contain description of the activities and measures and specify the amount of the achieved energy savings.

An important task is the control on a regular basis of the technological operations and the energy consumption related to them. The data on the different periods are compared and analyzed in order to find the reasons for deviations, excessive consumption as well as for the best achievements. After the analysis, the necessary operating measures are taken.

The control of the energy consumption by the main production sectors and units through continuous analysis of the energy consumption is another measure which the company implements.

For the period of the Business Plan 2017-2021 is envisaged expansion of the system for energy monitoring by planning the integration of the treatment plants for potable water, pumping stations for potable water, gradual integration of hydrophore installations, sewerage pumping stations

The benefits from the system for energy management are as follows:

- Availability of information about the energy consumed in real time
- Possibility to ascertain the condition of the equipment
- Storage of data for reports, analyses and comparison
- Implementation of preventative activities based on alerts in case of negative change of tendencies

The system for energy management allows the technological, engineering and managerial personnel to achieve the following objectives:

- Improvement of the efficiency and reduction of the costs for energy
- Ensuring the reliability of the work of the equipment and the reduction of the duration of water supply interruptions
- Optimization of the use of the installed equipment and reduction of the operating costs

The system allows:

- Combined measuring of gas, air, heat and electricity
- Monitoring of the power distributing network
- Integration with other SCADA systems used in SV

The table below represents the main functions related to the energy management:

No	Function	Period of implementation	Legislative document
1.	**Provision of reliable energy supply**	**Permanently**	
2.	**Preparation and control of the contracts for power supply**	**Annually**	
3.	**Reading energy consumption**	**Daily online**	
4.	**Reading the volumes of treated waters, sludge and generated electricity**	**Daily, Weekly, Monthly,**	**Internal rules**
5.	**Defining and reading the energy intensity of production and the indicators of energy consumption**	**Daily, Weekly, Monthly, Annually**	**Internal Rules**

6.	**Maintenance of a database for energy equipment and the devices measuring energy consumption**	**Updating when necessary**	**Internal rules**
7.	**Maintenance of the energy equipment**	**Permanent**	
8.	**Repair of the energy equipment**	**When necessary, planned repair, overhaul**	
9.	**Rehabilitation of the energy equipment**	**Under the rehabilitation programs**	**Under Company`s program for technological rehabilitation**
10	**Analysis of the common and specific energy consumption**	**Annually**	**Law on EE, art. 36**
11	**Conducting certification of buildings**	**Once every 10 years**	**Ordinance on certification of the buildings to EEA**
12	**Conducting energy surveys**	**Once every 3 years**	**Ordinance on surveying about energy efficiency to**
13	**Regulation of energy costs in production units**	**Annually, update in case of changes**	**Internal rules**

In May 2016 started the new survey for energy efficiency of the treatment plant for wastewater. In 2017 energy study of the treatment plant for potable water is about to take place

Planned measures for energy efficiency during the period 2017-2021 for **water supply service:**

E	R	S	U	W	Y	AA	AC
Проект	УСЛУГА	ТАРИФА	Очакван ефект ЕЕ kWh / 2017	Очакван ефект ЕЕ kWh / 2018	Очакван ефект ЕЕ kWh / 2019	Очакван ефект ЕЕ kWh / 2020	Очакван ефект ЕЕ kWh / 2021
Развитие на системата за енергиен мениджмънт на територията на ПСПВ Бистрица	доставяне на вода	СН	-8000	-16000	-16000	-16000	-16000
Разширение на системата за енергиен менджмънт за помпени станции	доставяне на вода	НН	-5000	-11000	-11000	-11000	-11000
Разширение на системата за енергиен менджмънт за помпени станции	доставяне на вода	СН	-5000	-11000	-11000	-11000	-11000
Подмяна на хидрофорни инсталации	доставяне на вода	НН	-60000	-120000	-170000	-210000	-210000
Разширение на SCADA	доставяне на вода	НН	-1500	-2000	-2000	-2000	-2000
Разширение на SCADA	доставяне на вода	СН	-1000	-1500	-1500	-1500	-1500

Planned measures for the energy efficiency over the period 2017-2021 **for wastewater treatment:**

E	R	S	U	W	Y	AA	AC
Проект	УСЛУГА	ТАРИФА	Очакван ефект ЕЕ kWh / 2017	Очакван ефект ЕЕ kWh / 2018	Очакван ефект ЕЕ kWh / 2019	Очакван ефект ЕЕ kWh / 2020	Очакван ефект ЕЕ kWh / 2021
Развитие на СКАДА за енергиен мениджмънт СПСОВ	Пречистване	ВН	-5000	-10000	-12000	-14000	-16000
Поетапна подмяна на помпени агрегати в СПСОВ	Пречистване	ВН	-5000	-10000	-15000	-15000	-15000
Основен ремонт на силови и осветителни инсталации в СПСОВ	Пречистване	ВН	-20000	-40000	-40000	-40000	-40000
Подмяна на помпите за калови води с честотни преобразуватели	Пречистване	ВН	0	-17000	-35000	-35000	-35000

Monitoring of the sewerage network

It is planned to construct a system of monitoring points in typical points of the sewerage network, equipped with devices for registration and transfer in real time of hydraulic and quality parameters of wastewater, visualized on SCADA.

The monitoring program of the sewerage network will cover major points from the main trunk sewers, connections from big draining areas, overflow facilities and main collecting and distributing shafts.

The points of monitoring are distributed into two main groups:

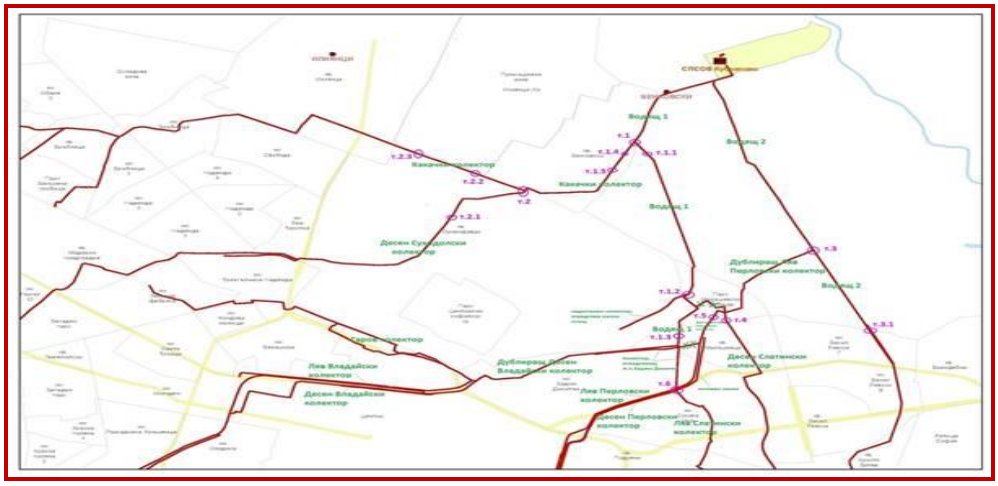
- Monitoring points for measurement of the hydraulic parameters of the water flow –volume, height and velocity.
- Monitoring points for measurement of certain quality indicators of wastewater – PH, electrical conductivity and suspended solids

The establishing a system of monitoring points for constant monitoring of the behavior of the sewerage networks has the following main objectives:

- Analysis and assessment of the infiltrated water volumes
- Analysis and assessment of the work of the system in dry weather
- Analysis and assessment of the work of the system during rain
- Analysis and assessment of the work of the overflow facilities
- Early warning for pollutants entering the network

The constant monitoring of the system will allow making specific analysis and assessment of the work of the sewerage network, which will ensure the improvement of the operational indicators and the taking of preventative measures for detection and removal of the pollutant and elimination of its impact on the normal treatment processes

In 2016 was planned the establishment of the first 10 monitoring points presented on the map below:



Measuring water volumes

Over the period 2017-2021 the highlights at the extension of the SCADA will be related to:

- Connection of new sites to SCADA – DMZ, DMA and PMA zones, pressure boosting installations and important typical points from the water supply network. The main objective is improvement and extension of the system for management and control will lead to faster reaction in case of problems with water supply, thanks to the monitoring of the parameters of the network in real time – pressure, flow, efficiency of the disinfection process etc.
- replacement of the existing meters in order to improve the accuracy of metering and the reliability of data; the project covers all sources of natural water, for which the company has issued permits and the expected result is improvement of the measuring of the abstracted water volume.

It is envisaged to replace the existing meters and to install new ones in order to increase accuracy by changing the type of the meters, to monitor all devices in real time via SCADA, to reconstruct the existing water meters shafts and to construct new ones, in order to ensure the necessary technical conditions for installation of meters of higher class.

The increase of the scope of telemetry will allow ascertaining potential failures or failures which have just occurred along the distribution water network and will contribute to improvement of the service to customers (positive impact is expected for the processes of management of the continuity of the service)

Security

The security of the facilities, of the infrastructure and the information is a key factor with reference to the quality of the services offered to the customers of the company as well as to the safety of the employees and the protection from malicious access and actions of outside persons.

During the period 2017-2021 the company plans on focusing its efforts on the development of the following projects in the area of security:

- Improvement of the physical security of the premises and the infrastructure
- Development of the security offered by real time control and management systems

The following activities are included into the scope of this project:

- Expansion of the quality control system of patrolling and checks performed of the premises with physical security (“live security control”). The insertion of additional microchips for checking in key spots on the way of the required daily and overnight passes in the premises (potable and wastewater treatment plants, the bases of the teams servicing the sewerage network);
- The establishment of video surveillance systems for the sites – potable water treatment plants, pumping stations, reservoirs. The installation of IP (network) cameras with infrared and volume sensors is envisaged for installation in remote facilities, which will function in a standby regime and send alarm signals when registering unauthorized access within the perimeter of the respective facility. The installation of cameras for zone surveillance is envisaged for the territory of the treatment plants, as well as cameras offering panoramic view. The construction of a high-level video surveillance system is envisioned, which will allow remote surveillance using devices (laptops, mobile devices – smartphones, tablets) connected to the company network. As a means of transferring the data from the video surveillance the present SCADA will be used. For the facilities, for which constant monitoring is necessary, instead of a standby mode, a wireless communication system will be built, which will allow working within 50 km from the surveillance point;
- Construction of access control systems for the strategic facilities operated and maintained by the company. It is envisaged that the access control system be constructed with modern technologies for discerning vehicle registration plates and physical features (profile of a human face);

Development of the security of the systems for control and management in real time

The planned activities over the period of the BP are:

- Protection of the critical infrastructure to minimize the impact in case of failures in t SCADA equipment;
- Maintenance of the implemented individually reserved servers for communication on the field and the double network links between the servers, including encryption of the information upon its transfer in view of protection against malicious access and data copying;
- Application of a security policy, which includes integrated identification of the customer, who has requested the access to the data and tracking of the events (reading data, visualization) by the so-called “audit paths” At the moment is constructed a system for access control to the databases of SCADA depending on the position and the function of each of the

employees. For employees who are allowed remote access and management of the facilities and the infrastructure is applied a system for increased security of the access by a different class of passwords for access.

- The reservation of a GPRS (3G) communication by provision of a radio network. The transfer of data by a radio network will include coding the input information and decoding after transfer in view of protection of the data against unauthorized copying;
- Eavesdropping on network traffic - it is an additional measure, which could be applied in case of indicated increased levels of danger. The measure if required will allow the identification of unwanted interference in the transmission of data between the server and the controllers, installed at the remote sites (pumping stations, valves with el. actuators, etc.);

As a basic approach and objective for the Commercial Directorate always the focus has been directed to customers and continuously improvement of customer satisfaction with the services provided. In this regard, the company continually strives to improve the impact of its work in the field of customer service. For example the implementation of single billing system and customer service (SAP) combine several processes performed by the Commercial Network Management Directorates and combining data of the client accounts in a single database. More detailed information is contained in t.6.2.10 of the technical part of the business plan.

Projects related to improving the efficiency of customer service, and which are to be implemented during the next regulatory period as the implementation of Quality Management Systems under ISO9001: 2015, modernize and expand communication and payment channels, plans for consideration and response to customer complaints and reduce uncollected receivables are described in detail in the next section point 5.13 and point 9.1 of the Financial part (on ISO9001: 2015).

In its policies and the practices Sofiyska Voda develops and applies modern forms of human resources management with the understanding that these factors are extremely important for the business development and the accomplishment of best results. The achievement and maintenance of balance between the interests of the employer and the employees is based on compliance with the law, adherence to budgetary discipline and social partnership.

The corporate culture of Sofiyska Voda is built on values as *Responsibility, Solidarity, Respect, Innovation and Customer Focus.*

The Human Resource and Administration Directorate is the connection between the needs of the business and the provision of professionals who follow those needs. In this regard, along with the established good practices for recruitment of the most suitable applicants, the constant improvement of the working environment and labour conditions, the appreciation of the individual contribution and the training and development of the employees, the Directorate has set the following medium-term goals:

- Development of a company system for job evaluation. The evaluation and the prioritization of the positions is crucial for the achievement of the strategic goals, the establishment of a fair remuneration system and focus the efforts on the key positions on which the company success depends the most;
- Creation of a Career development system to establish practices for retaining and development of key employees;
- Development of a system for in-house training with the purpose of sharing knowledge and experience and preservation of the corporate know-how.

5.13. STRATEGY FOR WORK WITH CUSTOMERS THAT INCLUDES A PLAN FOR CUSTOMER SERVICE IMPROVEMENT, PLAN FOR REVIEW AND REPLY TO CUSTOMER COMPLAINTS, AS WELL AS A PLAN FOR REDUCTION OF UNCOLLECTED RECEIVABLES.

INTRODUCTION – GENERAL STRATEGY FOR WORK WITH CUSTOMERS

Improving the quality of customer service is one of the main priorities of Sofiyska Voda, in accordance to the legislative requirements, contractual obligations towards the Municipality and Veolia group standards. As provider of a public service of utmost importance, the aim of Sofiyska Voda is to constantly improve the customer experience, by developing a pro-active attitude towards the customers, reducing complaints and other unwanted contacts, providing a faster and better quality reply to customer requests.

The customer service approach is an integrated one, covering all processes related to customer management and interactions: opening/closing of customer accounts, meter installation, meter reading, billing, payments, debt collection, management of customer contacts through all communication channels (call center, customer service centers, written correspondence, online) and irrespective of the nature of the customer inquiry, whether commercial or technical.

In this respect, customer care strategy goes beyond the dedicated organizational structures (Customer Service) to all departments which are directly involved in providing a final resolution to a customer case or support activities related to the customers.

During 2014-2015, Sofiyska Voda has deployed a major project aiming to improve the management of customer processes, namely the implementation of a new customer information system – SAP IS-U, replacing several existing software and databases. The new software provides now an integrated platform for managing these processes and enabled initiatives leading to customer service improvement: unique platform for monitoring and managing customer interactions, Automation of billing processes, new layout of the invoice, unique format of payment files for processing etc.

After stabilizing core processes, the next steps aim to tackle improvement areas in several customer related activities: meter reading, billing, debt collection, customer service, management of field interventions. The expected outcome is:

- To increase the speed and the accuracy of reading data; to decrease the interval between meter reading and billing
- To provide customers with extended and easy to reach the payment channels
- To provide the debt collection teams with more adequate tools for increasing their performance
- To move as much as possible the customer interactions to the online zone; facilitate faster communication channels and increase quality of service
- To restructure and modernize the customer service center network
- To improve the call center key performance indicators and extend its activities as a contact center (calls and back office activities)
- Improve response time to requests and complaints from the customers

I. PLAN FOR CUSTOMER SERVICE IMPROVEMENT

Customer service improvement is planned to be achieved across all processes related to customer interactions. The company commitment towards this goal is expressed by the initiative to implement a Quality Management System for the customer related processes and seek its certification under the standard ISO 9001:2015. The process has started in 2015, after finalizing another important project: the implementation of the new customer information system. To achieve this purpose, all customer processes have been reviewed, new procedures and work instructions have been enacted, quality objectives and key performance indicators have been established for all the customer service processes. More details on the topic are presented in Chapter 9.1 of the Business Plan.

The main actions aimed to improve the customer service are presented below:

1. Speeding up the process of management of customer accounts

The opening of customer accounts is the starting point in building a customer relationship. Sofiyska Voda plans to review this process in order to make it easier for the customer and shrink the deadlines between the different steps of the process.

The streamline of the process is planned to be achieved also by using online communication channels (requests related to customer accounts on the website and mobile application).

The deadlines for update of customer information and invoice corrections, based on customer complaints are also going to be improved, in order to provide a faster resolution of the customer case and avoid refusals of payment of the invoice due to late clarifications on the customer account balance.

2. Automation and improved control on the meter reading process

The meter reading is an activity with high impact on the customer service, since:

- It provides the input data for the billing process
- It represents one of the most frequent customer communication channel with the company
- Additional data collected during the meter reading activities can help providing a more accurate service to the customer

Currently only the revenue meters with big consumptions are read by Sofiyska Voda meter readers with PDA devices. More than 1 million individual meters and revenue meters in blocks of flats are read by a subcontractor on paper. Sofiyska Voda is now extending the reading by PDA devices to the subcontractor`s activities and the project will be finalized mid-2016.

For the period of the Business Plan, this will lead to:

- Improved accuracy of in the meter reading and therefore on the billing process, by elimination of manual errors in the data collection
- Reducing the period between reading and billing (currently 15 days)
- Providing more time for data checking in the validation process before the billing
- Reducing customer complaints about meter reading and billing

3. Extending the payment channels

Extending the payment channels aims to:

- provide the customers with a larger variety of payment methods, located closed to their dwelling
- reduce the number of cash payments in the Customer Service Centers
- increase the number of customers using online payments

Along with the implementation of the SAP system, a sub-project was deployed aiming to unify the format of the files exchanged with the external partners for payment, thus avoiding manual internal formatting and providing the possibility to automatize the payment process.

The next step is to negotiate with existing and new partners the opening of new payment channels for customers, especially access to online payment platforms, but also cash payments in the banks offices.

Although the online channel has had an increasing trend and is now the second after cash payments, cash payments still represented at the end of 2014, 68% from the total number of payments.

Since internal cash management raises several risks, including security ones, it is envisaged to gradually reduce it, in the context of a larger project of re-structuring of the Customer Services Centers.

Also encouraging online payments is part of a larger strategy regarding the online communication with customers.

4. Re-building the online customer communication

Online communication has enormously developed in the last years and Sofiyska Voda had accordingly adapted by developing several facilities for customers on its website. Since the current website has an outdated technology and high costs for supporting new optimizations, Sofiyska Voda intends to build a new modern platform, with improved functionalities. Also, in order to provide faster and easier interaction channels to customers, the company intends to develop a mobile application for customers and to organize customer communication through social media.

a. Developing new website

- *A new online identity*
  A re-design of the website is intended in order to provide a more friendly interaction platform with the customers, where information can be easily reached in an understandable manner.
- *New functionalities*
  New functionalities will be implemented, besides the existing one, such as:
- the possibility to implement different satisfaction surveys, on specific topics and collect the feed-back from customers, which can be used to improve our activities;
- Online video tutorials; video tutorials can be made and accessed from the website on different topics: where to pay your invoice, how to open a customer online account, how to check possible leaks on the internal network etc. This can be a very user friendly way to communicate to customers useful information in relation with Sofiyska Voda, as well as providing useful advices related to the water usage.
- Scheduling appointments for technical visits: customers could online schedule appointments for different services: non-regulated business, or technical interventions related to control readings, revenue meter installation or replacement, or other checks which require customer`s presence in his property. The pre-requisite for this service to customers is the internal re-organization of these activities, allowing scheduling to be made upon customers` requests.
- Web chat: the functionality will provide the possibility of a fast contact with the customer and resolution of requests for information or complaints

b. Developing a mobile application

Mobile applications will allow easy access for customers to the main functionalities of their customer account on the website: visualization of the current balance, invoices, payments, readings, dates planned for reading, water interruptions etc. Also the same facilities from the website can be made available on the mobile application: communication of self-reading, option for electronic invoice, option to receive SMS`s about water interruption etc.

c. Developing social media communication channels

The large scale use of social media is an opportunity for Sofiyska Voda to be closer with its customers and send faster and easier to reach messages or respond in a faster way to the customers.

Information about water interruptions can be posted on social media channels; different alerts can be sent by the company on social media accounts of customers, upon request; online self-services can also be provided on social platforms.

5. Re-designing the classic communication channels with customers

5.1. Modernization and extension of activities in the call center

The call center is the main communication channel with our customers, receiving in average 36.000 calls / month, which represent 63% of the overall customer contacts (34% contacts in customer service centers and 3% written correspondence and website).

The measurement of the performance in customer communication is also represented by the effectiveness of the channels which are providing fast information by the company with the least effort deployed by the customers in reaching us. Going to customer service centers or sending traditional written correspondence are time and effort consuming for the customers. In order to be closer to the customers, Sofiyska Voda targets an increase of the contacts by the easiest channels for the customers, such as call center, website and other online services.

Currently the call center works on a solution called InfoServ Call Center, which serves the basic needs in terms in call routing, call recording, reporting and IVR. The implementation of a modern solution is necessary in order to comply with the future developments in the customer service activity and support the improvement of the services provided to customers, through the integration with the new customer information system.

The new system will provide the following advantages:

a. Supporting an increasing number of calls

- **Inbound calls**

The implementation of the new customer information leads to an increase of the role of the call center. Having an integrated system allows the call center operators to be more reactive, to provide to customers all the information they need, including to schedule certain technical interventions requested by the customers. This leads to an increase of trust of customers in this communication channel and to an increased number of phone contacts, which will correspondingly decrease the visits to the Customer Service Centers and the written correspondence.

- **Outbound calls**

A proactive approach to customers implies providing information and anticipating customers` needs, without waiting for the customer to make a request. Developing outbound campaigns can serve this purpose, not only in terms of information about the water and sewerage service, but also in terms of non-regulated activities (developing marketing campaigns).

Outbound calls can be organized in order to frequently test customers` satisfaction about the service. The activity can be done by operators, or can be automated (automatic messages at the end of the conversation with an operator).

b. Supporting the debt collection activities

The debt collection department also performs call to debtors (an average of 23.000 calls per month) and this activity is supported by a low quality solution (Astra), which does not allow a proper monitoring of calls and has frequent failures.
In order to optimize the activity of the debt collection team, the outbound calls should be managed through the same modern solution.

c. Transformation of the call center into a contact center

This will be performed by extending the call center`s activities from call handling to other types of contacts with the customers, such as: online (website, mobile applications and social media), replying to specific written correspondence, or initiating written contacts.

d. Free line (0800) in the call center

The implementation of a free call center line will make the service more accessible to customers. Also, free of charge communication can be ensured with a new call center application which will allow Skype and Viber calls.

5.2. Re-structuring the customer service center network

There are currently 8 CSC`s located in different areas of Sofia, in which different types of services are offered to customers: payment of invoices, providing of information of any type, receiving written complaints, processing requests for new connections and other technical services.

As a customer oriented company, Sofiyska Voda`s strategy is to provide a faster service to customers, without customers having to waste time in going to a service center. This is planned to be achieved by moving at least 85% of the customer interactions to faster communication channels, which are the online and the call center. As a consequence, the need for having several service centers will no longer exist.

a. Reduce and modernize the customer service centers

The CSC network can be resized to 3 locations, where several types of improvements can be more easily made, such as:

- Task specialization of customer service employees in the centers
- Implementing a ticketing system, directing the customer to the right office, depending on the type of service
- Touch screen device, providing access to customer account and other useful information to the customer
- Online scheduling appointments with a CSC employee or supervisor

- Improved security for one office where cash payments will be kept for specific technical services

b. Mobile customer service center

Since the company serves not only the perimeter of the Sofia City, but also villages and cities within the Municipality of Sofia, whose customers may find it difficult to come to the company`s customer service centers, we are willing to serve them by a mobile customer service center.

This will be a special van equipped with the necessary technical infrastructure (computer connected to the customer information system), which will go to the served areas outside the city of Sofia, according to a schedule published in advance.

II. PLAN TO REVIEW AND REPLY TO CUSTOMER COMPLAINTS

The implementation of the new customer information system has provided a 360 view on customer interactions, through all communication channels. Therefore, the analysis of the customer contacts is no longer focused only on written correspondence and written complaints, but includes all communication channels (customer service centers, call center, website). In the previous configuration of the systems, only a quantitative analysis could be made, based on number of calls, visits in the customer service centers and letters. An integrated qualitative analysis based on specific types of requests and complaints and their trends has become possible only after the implementation of a unique platform for managing all customer contacts, based on a single classification of contacts and well-defined follow-up actions for monitoring the final resolution.

1. Overall review of customer contacts

Since the beginning of 2016, in the framework of the preparations for the ISO 9001:2015 certification, a monthly review of all customer service indicators has been implemented, containing:

- For the customer service centers (front office): number and trends of the total number of visits and spit by each customer service center; number of payments, number of letters submitted in the customer service centers; number of visits by reason; detailed analysis of the most frequent reasons for contacting the customer service centers
- For the call center: number and trends of incoming calls, served calls by operators, served calls by IVR, missed calls, average duration of the conversation, service level, number of calls / operator, number of calls per reason and sub-reason; analysis of the most frequent reasons for contacting the call center
- For the back-office: number of letters, number of website contacts, dead-line for answering to customers, classification of letters by reasons and sub-

reasons, repeated complaints, legitimate or non-legitimate complaints, status of temporary answers etc.
- Consolidated status of contacts by communication channels
- Follow-up of the number of contacts which represent complaints from the total number of customer contacts; the set target for complaints is not to exceed 20% from the total number of contacts, from all communication channels
- Actions for improvement proposed based on the abovementioned indicators and monthly follow-up of their implementation and performance

A specific classification of customer contacts has been implemented in the customer information system, allowing distinguishing complaints from requests and performing in-depth analysis by type of request / complaint, reasons and sub-reasons; this classification applies to all customer contacts, irrespective of the communication channel.

2. Review of replies to written complaints

The written correspondence, although it represents less than 5% from total communication with the customers (website included), is paid a particular attention since in most cases the letters are indicative of a more complex issue or which could not be resolved by the other communication channels.
The company has already started action plans based on the specific reporting which is now available from the customer information system and the business intelligence system, on the following areas:

- Extension of the 14 days maximum dead-line to all types of written correspondence, not only the letters which represent complaints
- Monitoring of the average dead-line for reply to the letters, in order to shorten it
- Strict monitoring of the temporary answers given to customers and limiting the dead-lines between temporary and final answer
- Analysis of the complaints based on their character: legitimate (a fault was made by the company) and not legitimate (the customer complaint is not grounded, no mistake was done by the company)

III. PLAN FOR REDUCTION OF UNCOLLECTED RECEIVABLES

The reduction of uncollected receivables is main strategic objective on which the company will continue to focus in the next regulatory period. The nature of the obligations arising from invoices for water, and the reasons for their accumulation are additional challenges for the company to achieve this goal. In general the debts resulting from utilities are characterized by a low priority for payment from households and businesses, and the bills for water and heat remain at the last places in comparison with the other ongoing costs.

According to the Association of collection agencies in Bulgaria (ACAB) with highest priority for the households when paying their debts are the payments for mortgage, repayment of bank loans and loans for goods, leasing, electricity, cable TV and Internet, mobile telecommunication services, and finally - bills for water and heat. This trend is directly dependent on and determined by the opportunities for provision of the receivable and/ or termination of the services.

The reasons for non-payment of invoices for water can be divided into two main categories – economic - political and social.

- *Economic-political*: purchasing power of the population, living standards, unemployment rates, periods around the elections (traditionally associated with increases of savings and cost containment), "anti-monopolists" campaigns by various organizations, and others.
- *Social reasons*: culture when consuming water and indiscriminate waste of water, personal hygiene, inefficient management of personal finances from households and over-indebtedness (effect of the debt spiral - take more to service old debts and current liabilities) level of involvement and protection of the meters in properties, preferences to the ways and channels of payment, and the like.

The company has no influence on the first category of reasons, as part of the plan for increasing the collection is precisely the implementation of active projects and activities directed to the second category of reasons, and optimization of internal resources:

1. **Human resources**
    a. *Number of employees* - after performing comparative analysis of the results and efficiency between internal teams and subcontractors for debt collection substantially improved efficiency of the internal teams was established. As a result, it was decided to reduce the number of the collection agencies from 2 to 1 but to increase the number of internal teams. Thus, a procedure for selection of subcontractor is under way, as the contract will enter into force from September 2016, after the expiry of the current contract (the contract with one of the collection agencies expired on April 2016). On the other side, from April 2016 the number of employees of the internal Debt Collection department was increased with 2 employees, as it is planned to increase it with 4 more employees in the period 2017 – 2018. The expected net effect from this restructure is increase on annual basis in the collection of the teams from *Phone Negotiations* and *Door-to-Door Visits* between 3-5% annually for the next regulatory period.
    b. *Qualification* – the internal Debt Collection department of the company have well trained, qualified and competent personnel in terms of management and collection of outstanding debts and can implement effectively their functions. For the purpose of permanent

enhancement of the competences as well as coping with the challenges, specific for the activity (managing stress and time, aggression demonstrated by debtors etc.) the Human Resources Directorate organizes annually courses and seminars to improve the qualifications in compliance with the current needs. For the last three years were held on average two courses/seminars a year, in which all employees from the Debt Collection department participated, and this tendency will continue over the period of the next business plan 2017 – 2021. Also in connection with the implementation of the Quality Management System under ISO 9001:2015 an annual program will be approved to improve the competence and the awareness of the employees.

c. *Motivation* – the specified above organization of courses / seminars for increase of the professional competences, which is also a way to show the importance and the commitment of the employees to the strategic objectives of the company, (incl. also increasing of collection) is used also to improve their motivation. On the other side, in Debt Collection department there are developed flexible bonus schemes for additional remuneration, which are used on the basis of the individually achieved results from the employees. The bonus schemes will continue to be used and during the next regulatory period as when necessary will be updated.

2. Material – technical resources

The implementation of the new system for billing and complex customer service (SAP) in March 2015 covers the process of debt collection, making it almost entirely automated. In addition to the operating system, functions an application for reporting and periodic reports (SAP Business Warehouse), to which were developed individual reports and statistics for the needs of the Debt Collection department. For the next regulatory period are planned the following actions:

a. *Analysis of the data and the results* – in process of development is the link between the main customer system (SAP) and the system for visualization of business data QlickView (Business Intelligence Data Visualization). This will allow preparing additional analysis of the data for debtors, thank to which it will be possible to us the most effective strategies for debt collection. QlickView provides the possibility to group debtors by different characteristic (amount of debt, type of customer and risk profile, territorial structure, average monthly consumption, average amount of the debt and number of not paid bills, common needs, etc.), preparation of Pareto analysis 80/20, as well as variable reports by different criteria. QlickView will become fully operational in 2017, which will significantly extend the

possibilities for more detailed analyses of the separate customer cases.

b. *Monitoring and control* – in addition to the above mentioned application QlickView, the other instrument SAP - Business Warehouse can be upgrade in terms of reports, as well as and in terms of creation of additional reports depending of the current needs of the department and environment.
c. *Call Center* – The Debt collection department of the company has equipped Call Center with 17 operators trained for phone negotiations. Over the new regulatory period is planned modernization of the old software (as stated in it. 5.1, b above)
d. *Mobile Security* - Debt Collection department has a mobile fleet of 5 cars, mobile cash devices and POS terminals to provide suitable ways for payment of the bills for the customers with outstanding bills

3. Activities and instruments for debt collection

The planned activities are one of the biggest challenges and are crucial for the successful realization and debt collection. Due to this reason during the next business plan are planned the following projects for improvement of the business processes:

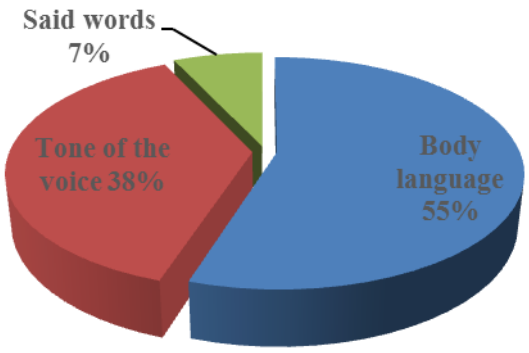
a. *Payment channels* – as specified in the above mentioned it. 3 in the plan for improving customer service the company plans to extend the payment channels by searching an active connection with the suppliers of payments services.
b. *Reminding letters* – in SAP the process for sending reminding letters is a standard functionality of the system, which is fully automated. Also, depending on the economic situation, as well as on the changes in the legal frame, the content of the letters can be immediately modified, so it will meet to the legal and business requirements. Also based on the current collection, the texts of the letters can be immediately corrected so that they are more efficient.
c. *Electronic communication* – in connection with the development of a mobile application which the company plans to implement (it. 4 from the plan for improvement of customer service), it will be possible for the customers to pay their bills through a cell phone or directly through the renewed website of the company. Also the company is actively trying to find a way by renewal of the telephone central as well to send short electronic text messages (SMS) to its customers with significant lower number of not paid bills (from 1 to 3) to remind them of the delays.
d. *Deferred payment agreements* – as socially responsible company and in the next regulatory period the company will continue to propose to

its customers with temporary financial difficulties flexible schemes and individual plans for deferral of the accumulated debts.

e. *Phone negotiations* – the telephone central is about to be renewed as described in it. 5.1, b.

f. *Door – to – door negotiations* - from 2017 are planned specialized internal trainings for the mobile teams negotiating at addresses, which will aim at increasing the ability for negotiation and recognition of the category of the debtor (4 combinations between two main aspects in the behavior of the debtor – possibility for payment as well as wish and intend for payment) in order to transfer the unfavorable categories into potential (for example, from category of debtor High possibility/low intention for payment to category high possibility / high intention).

Also provides are planned trainings to enhance the competences of the negotiating employees during negotiations. In a science research dated 1968 Psychology Today, psychology professor Albert Mihrebiyan proves the importance of the message is transmitted in a few ways (also known as "7-38-55 rule"), shown on the chart:



g. *Subcontractors* - as already indicated in the period 2017 - 2018, the company will continue to work with only one collection agency, which will be assigned complex customer cases in which the efforts of internal teams have not led to the desired result.

h. *Local authorities* - and during the next business plan, the company will continue to seek the cooperation and active communication with district administrations of MoS in connection with accumulated debts of municipal tenants. For example, we will continue to conduct the already approved monthly joint campaigns to collect debts from municipal tenants with very low social, educational and community status, and will look for opportunities to expand their scope.

i. *Court action* - after completing the link between the system for visualization of business data - QlickView (Business Intelligence Data Visualization) and SAP, the opportunities for timely identification of

customer accounts suitable for court collection of debt will significantly increase. Thus the efficiency of court actions will significantly improve.

j. Disconnection of services - together with the technical departments of the company, Debt Collection Dept. will continue to seek technical solutions to disconnect the water supply in properties with huge debts, where all options to collect or defer the accumulated debts have already been performed;

6. ANALYSIS AND PROGRAM FOR MANAGEMENT OF THE WSS SYSTEMS

6.1 ANALYSIS OF THE CURRENT CONDITION OF THE WSS SYSTEMS

Impounding structures and the facilities to them

Rila water main – The water main is in good technical condition. The installed air release valves, outflow channels, inlet flood gates (flood gates in the inlet water chambers of 14 syphons) function normally. In 2015 were repaired a total of 12 failures and in the village of Relyovo – 3 nos., and in the region above Simeonovo R.Q. – 9 nos. All these failures are due to comparatively weak geological foundation as result of which the water main in these areas gets displaced even insignificantly and in the range of the coupling, the lead gasket gets thrown by the water head.

Water main „Cherni Iskar“ - the water main and the facilities to it – air release valves, outlet channels, inlet and outlet flood gates are in good operational condition.

Water main „Dzherman-Skakavitsa“ - the water main and the facilities to it are in poor technical condition and in fact the same cannot implement their function.

Water main „Malo Buchino“ - the water main and the facilities to it – air release valves, outlet channels and flood gates are in good operational condition. At the beginning of 2016 one air release valve Φ250mm was replaced.

Two water mains DN 900 from HPP Simeonovo to Lozenets Reservoir – the water mains are in poor technical condition. As at many places along the routes of these water mains over ground lines of high voltage pass, electro corrosion has developed in these sections. It leads to the occurrence of failures, which due to the location and the comparatively big depth, at which are located (more than 3.50m) are very difficult to repair. In 2015 and at the beginning of 2016 were repaired 9 nos. failures. In the section at Yavorov alley at the beginning of 2016 it was necessary to apply the technology „cured-in place pipe“ with a total length of 200m for permanent recovery of the normal operational condition. In the business plan 2017 – 2021 it is planned to rehabilitate a total of 750 m of water mains using this technology and apart form that to establish a cathode protection for reduction of the effect of the over ground power lines.

Water main „Iskar“ – the water main is in good technical condition. The installed 4 nos. air release valves and 4 nos. outlet channels function properly. In 2015 was executed a repair of the air release valve installed on the outlet chamber of syphon Egulya. Stop The flood gates and the regulating valves installed in equipment chambers „Passarel“, „Zli kamak“ and „Peak 13“ are in good technical condition. In 2015 was replaced the speed relay of valve DN 2700 in equipment chamber „Passarel“.

Water main „Passarel“ – the water main is on good technical condition. The installed 6 nos. of air release valves and 8 nos. of outflow channels execute their functions normally.

Water main „peak emergency connection“ - the water main and the facilities to it– air release valves, outflow channels and flood gates are in good technical condition. In 2015 were repaired the inlet flood gates (cylindrical gates) at the inlet of Pancharevo PWTP.

Water mains from Pancharevo PWTP to Bakston Reservoir and Bakston PS /I-st nitka + gravity channel/ - and the two channels and the facilities to them are in comparatively good technical condition. In 2015 were reconstructed and replacement 3 outlet flood gates at Pancharevo PWTP – a connection between the two water mains.

Water main DN 1500 from Bakston PS to distribution shaft for the reservoirs Moderno Predgradie and Lozishte - the water main and the facilities to it are in comparatively good technical condition.

Water main DN 900 from distribution shaft for the reservoir Lozishte – 1.0 km total length - the water main and the facilities to it are in comparatively good technical condition. In 2015 along this water main were repaired 2 failures.

Water main DN 900 to the distribution shaft to the reservoir Moderno Predgradie - the water main and the facilities to it are in comparatively good technical condition. In 2015 along this water main were repaired 4 failures, and there is a tendency for their increase over the following years. In BP 2017 – 2021 is envisaged rehabilitation of this water main with a total length of 250 using the technology „cured-in place pipe“.

Water main from Bistritsa PWTP / II-nd nitka/ to the connection with I-nitka and gravity sewer - the water main and the facilities to it– air release valves, outflow channels and flood gates are in good technical condition.

Vitoshki water mains - Vitoshki water mains are: a water main from Valdajsko water catchment to Vladaya reservoir – Ø250; a water main from Star Vladajski water catchments to a pressure reducing shaft at Advokatite hut– Ø125; a water main from second Vladajsko water catchment to the huts at Zlatnite Mostove – Ø100; a water main from water catchment Kamenno zdanie to Kopitoto hotel– Ø100. To these water mains are included also all connections to the relevant huts and stations. In general, it could be stated that the operational condition of these water mains is unsatisfactory. In 2015 on them were repaired a total of 11 failures and there is a tendency for their increase over the following years. In 2017 and 2018 is

envisaged replacement of most of the routes of these water mains with a total length of about 4.5 km.

In order to limit the areas of water supply interruption at a repair of impounding structures and facilities in BP 2017 - 2021 are envisaged the following main activities:

- Replacement of 1 valve DN 1800;
- Replacement of 13 SV's DN 800;
- Replacement and installation of new 21 air release valves Ø200;
- Rehabilitation of 101 shafts for outlet channels and air release valves, inlet and outlet chambers of syphons;
- Replacement of a water main DN 700 from Pod Simeonovo reservoir to Iztok Reservoir with length 850 m;
- Replacement of 5 km „Vitoshki" water mains;
- Replacement and installation of new 30 outlet channels SV Ø200;

Main water catchment and catchment points

Water catchment „Beli Iskar" - Water catchment „Beli Iskar" and the facilities to it are in good technical condition

Water catchment „Levi Iskar" - Water catchment Levi Iskar and the facilities to it are in good technical condition

Water catchment „Emergency" - Water catchment Emergency and the facilities to it are in good technical condition

Water catchment „Cherni Iskar" - Water catchment „Cherni Iskar " and the facilities to it are in unsatisfactory technical condition

Water catchment „Preka Reka " - Water catchment „Preka Reka" and the facilities to it are in good technical condition.

Water catchment „Pavlovitsa " - Water catchment „Pavlovitsa" and the facilities to it are in comparatively good technical condition.

Water catchment „Loposhnitsa" - Water catchment „Loposhnitsa " and the facilities to it are in poor technical condition. The water catchment was disconnected permanently.

Water catchments along the derivation „Dzherman-Skakavitsa" – all water catchments from the derivation are in very poor technical condition and in fact the whole derivation and the facilities to it cannot execute their function. In terms of operations the maintenance and the functioning of this derivation is highly inexpedient.

Vladajski water catchments – 3 nos. – the three water catchments are in satisfactory technical condition.

Old „Vladajski" water catchments (catchment points) – the total number of these catchment points is 11, and all are in satisfactory technical condition.

Water catchment „Kamenno zdanie" - Water catchment and the facilities to it are in good technical condition

In order to ensure the reliability of water supply and maintain the SRAs in compliance with the valid at the moment legislation in BP 2017-2021 are envisaged the following activities:

- Reconstruction of water catchment *Cherni vrah* in compliance with a prepared investment project;
- Capital maintenance of all stated water catchments and catchment points without the facilities along the derivation “Dzherman-Skakavitsa”

Reservoirs

In general it might be stated that the reservoirs which are operated are in comparatively good technical condition. In 2016 is envisaged rehabilitation of the water chambers of one of the oldest reservoirs servicing the capital – Lozenets reservoir, by which will be completed its overall technical renovation

In order to limit the inconveniences for the customers during repairs and other routine works in the reservoirs on the territory of the concession area in BP 2017-2021 are envisaged the following main activities:

- Replacement of 25 nos. SV DN 800
- Replacement of 8 nos. SV DN 600;
- Replacement of 7 nos. SV Ø400mm;
- Replacement of 6 nos. SV Ø350mm;
- Replacement of 12 nos. SV Ø250mm;
- Rehabilitation of the dry and water chambers of 17 reservoirs;

By these activities will be ensured quick and reliable termination of sections from the network and the water losses from the water chambers of the reservoirs will be limited.

6.2. FOR IMPROVEMENT OF THE MANAGEMENT OF THE SYSTEMS – SYSTEMS AND REGISTERS

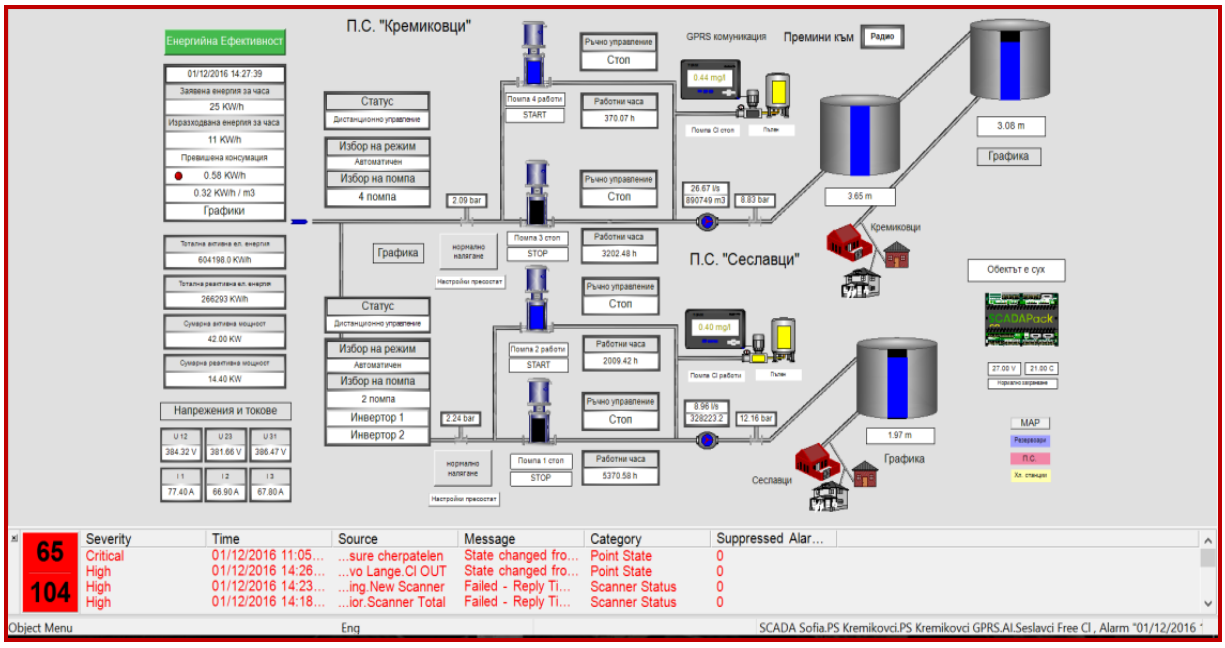
6.2.1. SCADA system – current condition, implementation of systems

The company has a SCADA since 2001 and initially to it were connected 44 reservoirs whose water levels were monitored. At the moment, the system for control of the water supply system is the last but one version of Schneider Electrics ClearSCADA. This version of the system was integrated in 2014. The software ClearSCADA allows the experts from the company to monitor and manage in real time the facilities of the water supply system.

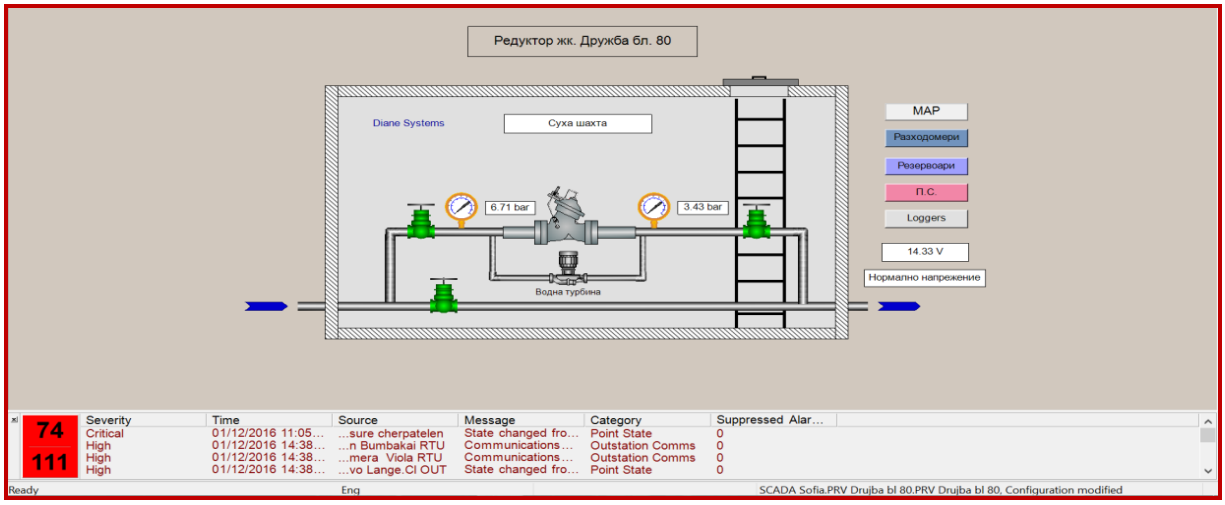
At the moment to the system are included 48 reservoirs, where different parameters are monitored, 33 chlorination stations, 14 pumping stations for potable water and two pumping stations for wastewater, the level of the wastewater of Vladajski sewer, 68 flow meters along the water supply network, 70 loggers for pressure and flow, 30 pressure boosting devices, 20 valves with remote reading with diameter of the water main from Ø700 to Ø2000, 17 valves along the distribution network with electric actuators in Mladost 1 r.q..

In 2015 started the preparation of own employees in Electrical and Mechanical Maintenance Dept. for maintenance of the SCADA systems, with which the company aims at reducing the risk resulting from the use of an external service for maintenance of the systems for remote monitoring and control.

In Kremikovtsi Pumping station a system for management of energy efficiency was introduced.



At the places where there is no opportunity for provision of electricity for the purposes of monitoring in real time of the PRVs supply is executed by a water turbine.



SCADA system is used also regarding the security of the sites – a communication center was established in the town of Buhovo:

Video monitoring and security of strategic sites was implemented:

- Beli Iskar Dam:
- Reservoir and chlorination station Bakston
- In 2016 the planned expansion of SCADA includes
- Replacement of telemetric station of 1 chlorination station;

- Replacement of telemetric stations of 1 PS for potable water;
- Duplication of the connection of 2 PS's for potable water;
- Duplication of the connection of 2 stop valves with electric actuators;
- Visualization of PLCS for control of the pumping groups of 2 PS for potable water;
- Visualization of the inlets of 12 PMA zones by installation of an inlet turbine due to lack of electrical supply;
- Visualization of the inlets of 10 DMA zones by installation of a water turbine due to lack of electrical supply;
- Visualization and management of 25 hydrophore installations;
- Establishing alternative power supply for the communication with SCADA and replacement of the existing batteries on 6 pressure reservoirs;
- Installation and visualization on SCADA of 6 flow meters for potable water at the inlet of the system and the inlet/ outlet of a potable water treatment plant;

Over the period 2017 - 2021, the company plans to focus its efforts in the development of the following projects in the field of security:

- Improvement of the physical security of the facilities and infrastructure
- Development of security systems for monitoring and control in real time.

More information for the project is described in t.5.12 Program for improvement of company efficiency.

Over the period 2017- 2021 the expansion of SCADA will aim to:

- Duplication of the communication of the reservoirs, pumping stations etc. in order to increase the security of management of the water flow
- Replacement of batteries with alternative power supply for the communication equipment SCADA
- Connection of new sites to SCADA - stop valves of strategic water mains, chlorination points, water meters, hydrophore facilities etc.
- Establishing an alternative power supply at the inlets of the PMA zones and their visualization on SCADA
- Visualization at the inlets of the DMA zone in SCADA for preparation of balance of the system in real time
- Visualization of the newly-installed meters on SCADA;

The planned sites over the period 2017 - 2020 are as follows:

- Pressure reservoirs - 8 nos.
- Water supply pumping stations – 2 nos.
- Construction of water meter shafts – PWTP – 4 nos.
- Chlorination stations – 2 nos.
- Stop valves with electric actuators of strategic water mains– 2 nos.
- Connection to SCADA of important facilities along the water supply network – 2 nos.

- Inlet PMA zones – 12 nos.
- Inlet DMA zones – 10 nos.
- Pumping hydrophore devices– 25 nos.
- Replacement and installation of water meters– 8 nos.
- Installation of chambers for remote CCTV survey of sites – pumping stations and WWTP;
- Construction of a system for monitoring and visualization in real time of the KPIs for potable water in the water distribution network

6.2.2 Assets register – current condition, creating a register

The information under this point is given in the following (6.2.3), as the assets register of the company is part of the geographic information system (GIS).

6.2.3 GIS – current condition, implementing a system

The project executes activities related to the stock taking of the assets, maintained by SV.

The main activity under the project is maintenance and update of GIS with technical parameters, condition and documents for the assets. The list of the assets refers to WSS networks, facilities, buildings, operational events etc,

The main objective of the project is to maintain updated register of the assets managed by SV in complaince with the Concession Agreement. It is a long-term project and the main activities are planned on an annual basis.

The reasons for the implementation of the project are a few:

- The conditions in the Concession Agreement and compliance with the requirements of the EWRC;
- Business efficiency ;
- Improvement of the KPIs of the services
- Establishing hydraulic models of the networks.

The achieved effects from the implementation of the project are:

- The development of the project improves the data bases of the conduits and the facilities to them on the territory of the concession area
- The updated register with parameters and the condition of the assets allows reducing the costs for operation and is a necessary prerequisite for the correct management of assets, as well as for the development of optimal investment (business) plan of the company.
- Positioning revenue meters in GIS and connecting the system with the system for billing allows the preparation of reports and analyses, e.g. analyses of revenues by territories etc.

The implemented activities since the start of the project are as follows:

- The establishment of the GIS starts at the same time with the Concession Agreement
- In 2003 is prepared the first Asset Register and since then it has been updated annually on the basis of the information in the GIS.
- In 2005 the register of assets is added with part *Buildings*.
- In 2009 is prepared and is annually renewed an Assessment of the condition of the assets – *Networks and Facilities*.
- In 2010 - 2011 the existing to the moment GIS is entirely renewed.
- In 2012 to the Assessment of the condition of the assets is added part *Assessment of Buildings*.
- The data base for assets is kept as updated as possible and measures are taken for improvement of the accuracy of the location of the assets.

The development of the project is considered in the long-term aspect due to the dynamics in the maintained information from the data base. For the next period is envisaged:

- Maintaining an updated Assets Register, Renewal of the methodologies for assessment of the condition of the assets
- Updating the GIS technologies used in the company by implemented a modern organization and work methods with GIS data
- Adding, changing and expanding the existing functionalities of the system related to change of the business processes, implementation of other information systems or change of the legislation;
- Regular update of the actual layers of the over ground cadaster in digital mode;
- Extension of the data bases for operational events and the condition of the assets;
- Extension of the use of GIS in different units of SV including the implementation of mobile GIS solutions
- Proposing new services to customers of SV based on the existing GIS and used on the website of the company

6.2.4 Register of failures – current condition, creating a register

The efforts of SV in 2015 were and continue to be aimed at improvement of the reaction in case of failures, a lot better awareness of customers for upcoming water supply interruptions being implemented by a web-based platform for visualization of the zones, affected by emergency and planned water supply interruptions, as well as the implemented investment WSS projects.

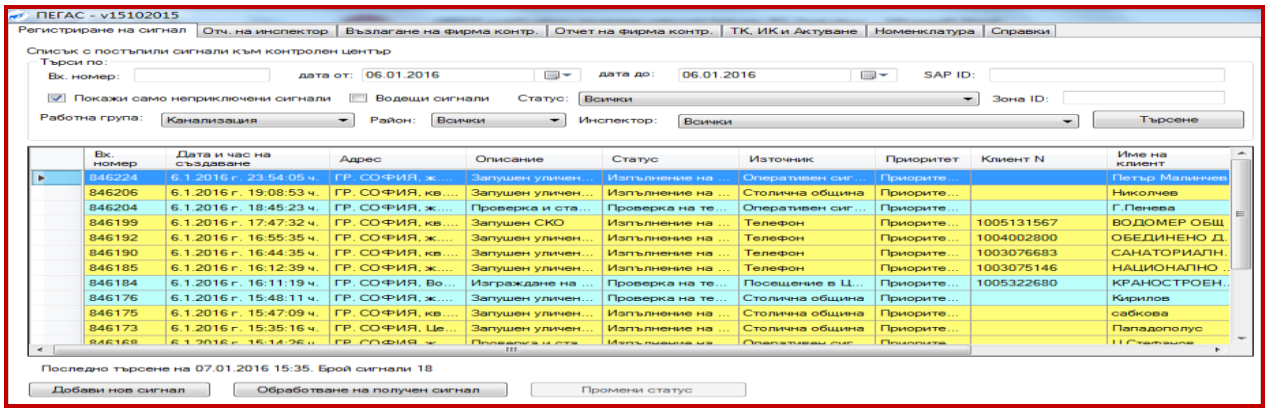
The interest of the customers in the service SMS notification for planned water supply interruptions has increased. They receive information in advance about the

zones of water supply which they have determined. The reduction of the time for repair of the failures as well as the reduction of the duration of a water supply interruption, related to repair works, and the increase of the number of the planned repairs also contribute to the reduction of the stress factors related to the network and of the number of failures that occur.

SV uses a software system for registration and reporting of failures along the water supply and sewerage networks, which in March 2015 was replaced by a new software product. The registration of failures is ensured by 24-hour work regime of teams, which register, distribute and inspect the registered signals for issues with the WSS equipment and networks, The signals of the customers are registered in a new customer database, which by an interface transfers automatically the signal in the Pegasus system for assignment and reporting of the failures along the sewerage and the water supply networks, where is executed the assignment, reporting and preparation of payment documents for the failures.

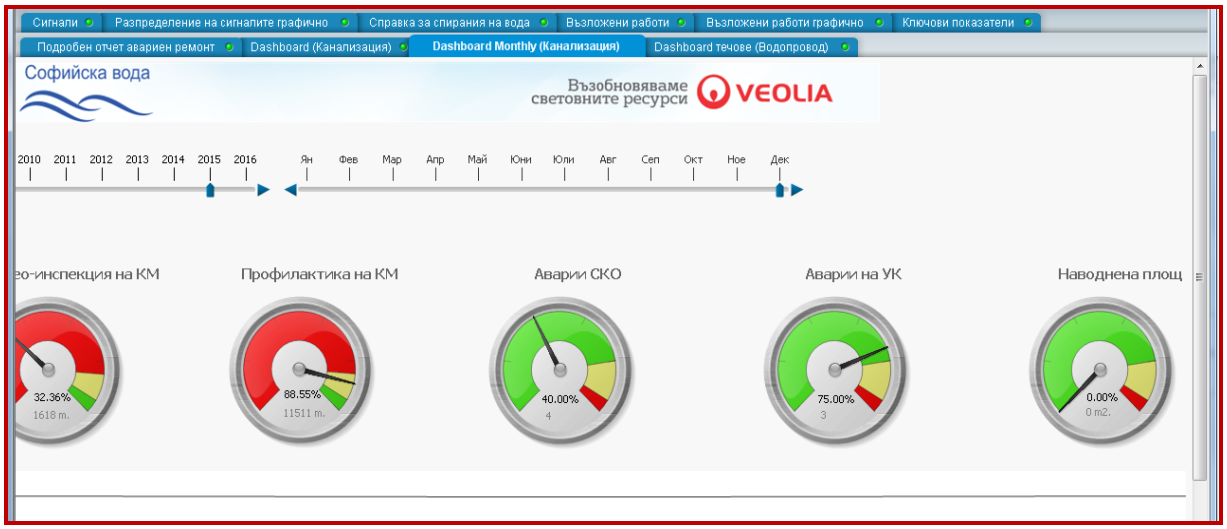
The assignments for repairs of the failures contain information for the type of the failure, the necessary activities, materials and other technical parameters. After the repair of each failure reporting is carried out of the used materials and the executed activities, which is controlled by the internal teams of SV and is registered in *Pegasus* software system

Photo 1 Screenshot of the software for control of assigned works and the reported repairs



Moreover, in March 2015 the company introduced also an automated system Qlikview for reporting key performance indicators. Using the system at fixed rules for calculation, which are set, reports are generated of the different indicator for the activity (Photo 2). The system allows monthly and annual tracking of the achieved levels compared to the set objectives and is used both for managerial purposes and for presentation to the interested parties.

Photo 2 The automated system for reporting of key performance indicators Qlikview



In the system besides the emergency repairs of the sewerage network, presented above, are tracked also a large number of activities, which the teams of Sofiyska Voda carry out to maintain the sewerage network. These activities improve the throughput of the system proactively or after a signal from customers for difficulties with the wastewater removal.

The current registers of the failures are characterized with high level of accuracy of the information, access to software systems only to authorized customers, who have different rights to register and process information depending on the specific obligations and responsibilities.

6.2.5. Register of laboratory analysis of the potable water quality - current condition, implementation of a register

The Laboratory of Sofiyska Voda has implemented and uses specialized licensed software for laboratory management WinLIMS Version 6 since 2010. The Laboratory owns 10 licenses for access to the software (access in the same time from 10 computers maximum). Based on data from WinLIMS on a daily basis is being done an automatic back-up copy to preserve from data losses. The administration of WinLIMS is being done by an employee of the Laboratory. Maintenance and upgrades are ensured by the producer for which a contract between the two parties is concluded.

Employees in the Laboratory have access to the software from each computer. The access is ensured with individual usernames and passwords which are created and activated by the administrator of WinLIMS when a new employee is appointed to work in the Laboratory. According to the position and the responsibilities of each employee, each user has access to different functionalities of WinLIMS, preliminary defined by the administrator. When an employee leaves the company the administrator of WinLIMS deactivates his/ her access.

Each incoming sample for analysis in sector Potable Water of the Laboratory is registered in WinLIMS. Each container receives unique identification code from the software. To this code is referred analysis which should be executed by indicators and methods, and analysis is assigned to particular laboratory specialists. Each of

the specialists insert the results as refer them to the respective analysis, as record the type of the matrix used as well as the reason for sample-taking and analysis.

From the database of WinLIMS are generated forms for quality, a part of the System for Management of the Laboratory under the accreditation standard БДС EN ISO/IEC 17025. All results from analysis and raw data, obtained in the course of analysis execution, are recorded in WinLIMS. In WinLIMS are registered also data for the checks of the parameters of the surrounding work environment as well as information for the instruments for analysis execution.

Based on the registered samples and inserted information for them in WinLIMS, the software generates logs and forms with information for conservation and destruction of the so called *control samples*, incoming-outgoing log; orders for sample-taking; daily and monthly reports with results from analysis and respective protocols. The software keeps information for the corrections done on already recorded data, incl. what is the correction, by whom it was done, date and hour of the correction.

Each sample receives respective status depends on whether it was accepted or not, whether the data from analysis was recorded. Methods and matrices, for which legal requirements are effective, are inserted in WinLIMS. In this way the software compares each recorded result with the legally defined values. As it depends on whether non-conformity is found or not, each result receives different status in WinLIMS. The results which are showing non-conformity are colored in red.

WinLIMS gives the opportunity to generate a numerous reports with data from analysis, visualization of graphs and tendencies for a period of several years back. Complete following-up of each accepted and registered sample is ensured - site, date, hour of sample-taking; name of the specialist taken the sample; methods of analysis; laboratory specialists executed the analysis; results from analysis, incl. the raw data and formulas for calculation; protocols from analysis.

6.2.6. Register of laboratory analysis of the waste water quality - current condition, implementation of a register

The implemented software for laboratory management WinLIMS is used in the same time in the three sectors of the Laboratory - sector Potable Water, sector Waste Water and sector Logistics for the purposes of registration of samples from water used for potable needs and waste water as well as to ensure conservation of results from the analysis.

6.2.7. Customer complaints register - current state, register implementation

Since March 2015, Sofiyska Voda has been using the new customer information system, SAP IS-U.

The new system provides a customer interaction center platform, allowing the registering of all customer contacts, irrespective of the communication channel: visit in the customer service center, phone call in the call center, letter or website contact.

All customer contacts, irrespective of the communication channel, are registered in the customer database (CDB), which contains pre-defined classifications, by type (contact class) and sub-type (contact action). The definition of the contact type also contains its referring to the category “request” or “complaint”.

- Customer contact types classified as “requests”:
  - Customer accounts (CA)
  - Customer information (CI)
  - Non-regulated business (NRS)
  - Requests about invoices and payments (RIP)
  - Requests about meters (RMR)
  - Technical services new connections (TSNC)
  - Requests water supply services (ZW1)
  - Requests sewerage services (ZS2)

- Customer contact types classified as “complaints”:
  - Commercial complaints billing (CCB)
  - Commercial complaints meters (CCMR)
  - Quality of works (QW)
  - Complaints water (ZW2)
  - Complaints sewerage (ZS1)

When the customer request or complaint is resolved immediately, by the information provided or the actions performed in the Customer Service Department, only the contact is registered in the system. Besides its classification, the contact will contain the communication channel, as well as additional information.

When the solving of customer request or complaint requires further action to be done in another department, the customer service employee will open either a notification, or a work order, as follows:

- A notification is opened when a back office activity is requested
- A work order is opened when a field activity is requested.

An exception to this rule are the operational requests and complaints which are further processed in Pegasus (software for management of operational activities), since the interface between the CDB and Pegasus is built on notifications (the information about the status of processing of the request / complaints is transferred from Pegasus in CDB as statuses of the initial notification, created from the Customer service department in CDB).

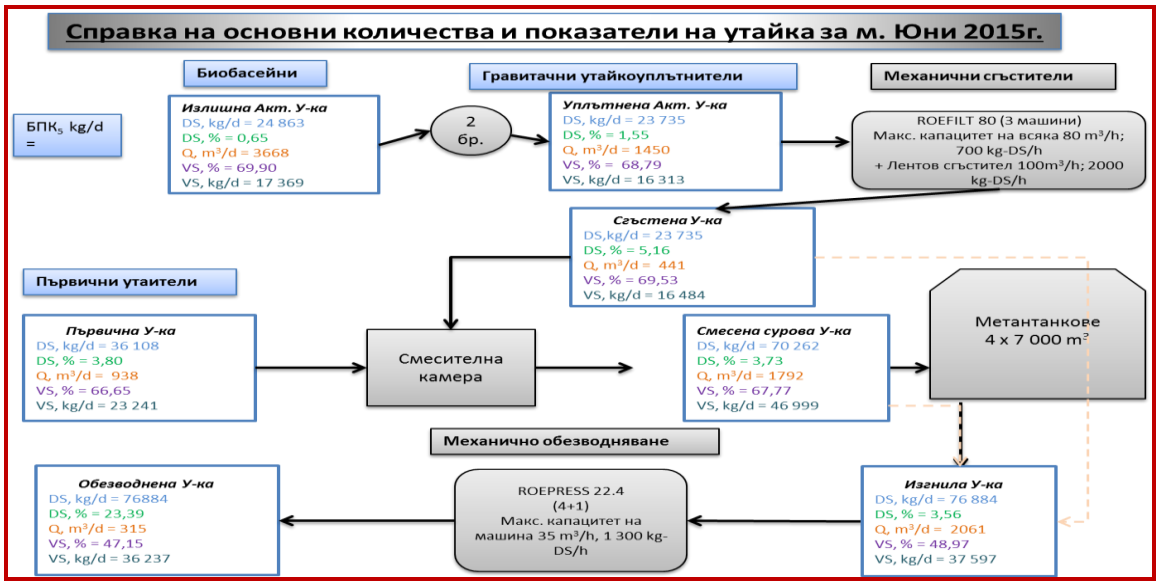
For all written correspondence (received in the customer service centers or in the mail registration unit) as well as for website correspondence, a specific type of notification is created in the system, which contains additional information about the registration number in Archimed (the document management system), the answer given to the customer and the date of the answer.

The paper documents (letters from customers and written answers from the company) are scanned and archived in the Archimed system.

SAP IS-U system provides a standard report on the registered contacts, by type of contacts, communication channel, periods. Several reports have also been developed in the BW system (SAP Business Warehouse), for more detailed analysis by type of contacts, notifications, deadlines, responsible employees etc.

6.2.8. Register of sludge from WWTP – current condition, creating a register

Daily, monthly and annual reports, balances and analyses of the generated, treated, dewatered, deposited on the drying beds and utilized sludge from Kubratovo WWTP.



6.2.9 Register of the water meters on WSC (measuring device) – current condition, creating a register

There is an electronic register / data base for the meters on WSC, which contains:

- Data for water meters:
  - Manufacturer's number
  - Number of plastic seal
  - Unique identification number
  - manufacturer
  - size of connection;
  - year of installation
  - year of expiry of the period of the metrological inspection
  - location of the water meter node
- data for customers:
  - name
  - property address
  - customer number in the system
- measured volumes:

Number of sources for the register – one.
Source type – operating system of the company (SAP).
Period of update – monthly

6.2.10. System for Reading and Billing - current state, register implementation

The newly implemented customer information system SAP IS-U, integrates also the reading and billing processes, which in the previous period were managed in two different systems.

The management of the two processes in an integrated system eliminates all the risks and issues from the previous configuration of the systems, related mainly to the double entry of some information and partially automatized interfaces.

In an integrated system, the information is entered only once and can be seen and used in other modules in which different processes are managed. Therefore, the data about meters, as well as the readings are entered in the Device Management module of the system and are used in the Billing module for issuing the invoices.

The reading data from the PDA devices is automatically transferred in the SAP system, through a specific interface. Before being used in the billing, the data undergo a validation process, based on configured criteria for plausibility of the readings. The system provides the possibility to define consumption thresholds and acceptable deviations from the average consumption. The meter reading results falling outside the set criteria are displayed in a list of implausible readings and cannot be billed unless an employee releases them for billing, after performing a check.

The meter reading and billing schedule are linked in the system. The billing schedule is set on a daily basis, based on “portions” – one portion groups all the meter readings units which need to be billed in one day. One meter reading unit contains all the installations (consumption places) which need to be read in one day. It is therefore possible to control if for all the installations we have readings in the system and if all of them are billed.

The billing process is composed of two sub-processes: billing and invoicing. The billing is the calculation of the consumption and is a reversible process, which can also run in a simulation mode. The installations which could not be billed appear in a specific error log and are distributed for further check by the employees. Also the walks with more than 20% of common needs are distributed for check. An additional check based on thresholds of amounts by categories of customers, is performed; the invoices which exceed a defined amount are displayed by the system in a list and are blocked from billing until they are released by an employee, after check. The invoicing is the sub process creating the accounting document in the system. Once the invoices are generated, the process cannot be reversed.

6.2.11 Accounting system – current condition, implementation of a system

The implementation and the current condition of the accounting system in line with the rules and instructions for the uniform accounting system are described in the ***Appendix Accounting system – current condition'***.

6.3. PROGRAM FOR IMPROVEMENT OF WSS SYSTEMS MANAGEMENT - DATABASE

6.3.1. Database with the measured water volumes at the WS inlet - current state, implementation

Current state:

Measurement of water volumes at WS inlet is performed according to flow meters which are in metrological validity and are monitored through the system for water supply management (SCADA). All these measurement devices are property of Sofiyska Voda. The data for the monthly reports of all water meters are registered by SCADA and are entered into an e-table in Excel format. The information is stored on a main server of the company. Only authorized employees are entitled the right to access. The control on registering the information in the database is performed by Management and Water Balance Manager and by Management and Water Balance Chief Engineer. On the basis of these data daily reports are prepared which serve as information for the inflowing daily volumes and determining the water losses.

Implementation:

In 2016 and 2017 a periodical replacement of the type of flow meters at WS inlet is envisaged with ultrasonic ones with two external sensors with ultrasonic ones with four internal sensors.

Implementation of additional development is planned through which a report with the water volumes will be automatically generated and in such a way the human factor in filling in the data in the report will be avoided.

6.3.2. Data bases for individual flow meters and data loggers – current condition, implementation

At present SV uses 420 permanent devices for flow measurement, which are used for:

- Metering at the inlet/ outlet of the systems
- Metering strategic facilities – PWTP, strategic water mains, PS, reservoirs etc.
- Measuring all types of zones along the system

The types of metering devices as well as the rules for their use are described in detail in the Annual Report for 2015 in the section "Strategy for measuring of water volumes". A change in the strategy is only the wish of the of the company to reduce the number of the electromagnet probes along the system in exchange for flange water meters on bypasses – the reasons are described in it. 2.10 of this Document.

Sofiyska Voda JSC uses data loggers for a few key activities, which also justifies its types:

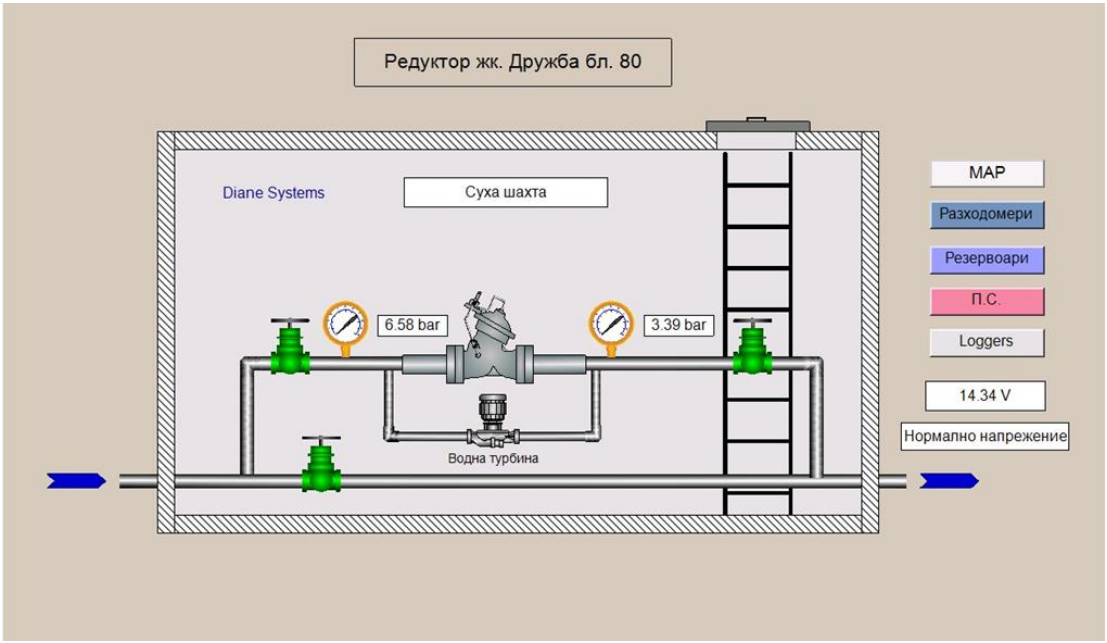
- Loggers without telemetry for pressure measurement – they are used for tests, measuring campaigns, measuring at revenue maters, etc. This type of devices is fully used for temporary measurements – they do not stay permanently installed on the system. The Company has 60 such loggers.
- Loggers without telemetry for installation of underground fire hydrant – they are used for inconstant measurements on the network without needing installation at customers. 49 are used.
- Loggers with SMS telemetry – this is the old generation of loggers purchased mainly in the period 2008-2010 for the needs of the DMA Program. The Company has more than 400 of them, as 305 are constantly monitored on the measuring points on the system and the SMS telemetric system continues to work in a relatively trouble-free manner. Although morally obsolete, they will be maintained in operation as far as it is possible because they are functioning devices in an already implemented system.
- Loggers with GPRS communication – the modern solution for remote transfer of data. Sofiyska Voda has implemented this type of loggers since 2011 but due to their still high price and the need of constant implementation of new telemetric systems, their number at present is 130 devices. The implementation of this type of loggers on a larger scale is connected with the strategic solution for uniform database and a system for monitoring of the network, which will happen within this Business Plan.

Extremely important for the communication with the measurements on field are a few facts. All loggers use the GSM network for communication environment. Unfortunately, very important measurement points are located at places with weak or lack of GSM coverage – mainly in mountain and forest terrains. This requires manual reading of the devices, which is a serious obstacle for the automation of the reading process and making the balances of the zones. At present between 7% and 12% of the devices are manually read, which directly depends on the human resources, the weather conditions and the transport provision for the process.

Another serious case is the need of powerful energy source for the communication of the logger with the servers. The built-in batteries have 1-2 years life at maximum, which is not economically justified. Options are tested with external batteries, but keeping the water impermeability of the whole installation is difficult to achieve. The use of solar panels is possible only at protected places – most frequently sanitary restricted areas due to the high risk of thefts.

Sofiyska Voda for a year almost has been testing also the option for the installation of water turbines in the shafts. This solution has a big potential – moreover, the products at the market are increasing – but it is possible only for pressure reduction

units in order to have the needed differential difference in the pressure so that the turbine works.



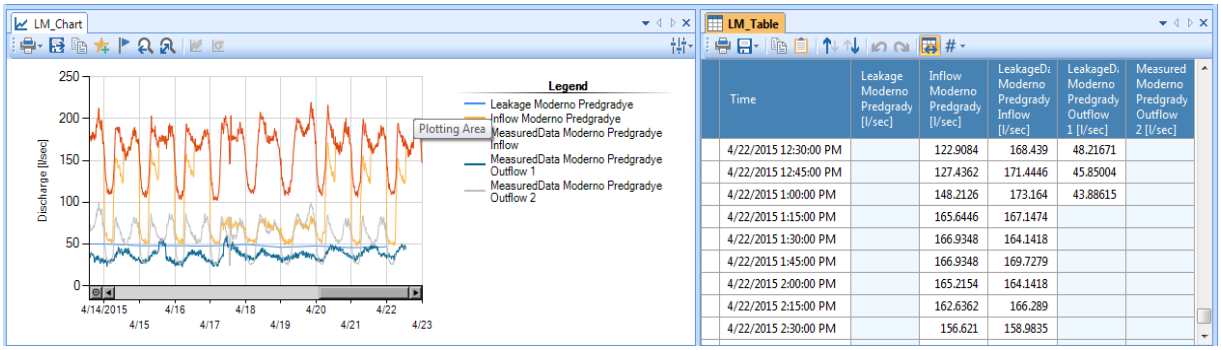
The flooded shafts are a problem for all technologies and seriously complicate the operation of the system. The only good solution is the construction of sewerage close by for which in the current business plan are not planned financial resources.

Due to the necessary automation of the process of preparing balances of water volumes and uniting the servers with hydraulic data in a single database, in 2015 was tested the specialized software platform *Leakage Monitor*.

Leakage Monitor is a system that facilitates decision-making and automated assessment of leaks with a focus on the economic aspects of their reduction. It is used for automatic data collection and assessment of indicators. The data from the monitoring of the installed flow meters and pressure sensors are automatically collected in a database where they are stored, analyzed, checked and assessed.

Connection is maintained with the database from the historic monitoring and connection to other sources with measured data. Data from the customer information system or data on billed water are also necessary. The results are compared with the assessment of the night inflow in the given area. Certain indicators (economic, technical) area applied for assessing the work of each area.
During the 3-month test period, 5 pilot DMAs were implemented:

- ✓ DMA 102 (Mramor);
- ✓ DMA 201 (Moderno Predgradie);
- ✓ DMA 323 (Krasna Polyana);
- ✓ DMA 413 (Gorna Banya);
- ✓ DMA 482 (Vladaya);



The systems allows the monitoring of the volumes supplied in the network both through desktop application and through web-interface, which makes it universal for access from any mobile device which has an internet access.

The main difficulties in the implementation process concerned the creation of connections with the servers for storing data from the water measurement points in the DMAs. Due to the specifics of the software products and the databases, the connections were not created directly but as follows:

- Telemetry – daily exports through Excel files;
- SCADA – daily exports through Clear SCADA, stored as requests in the database SCADA link.accdb;
- GPRS server - daily exports through CSV files;

The introduction of a software for online monitoring of the network will allow early deteremining of the deviations in the supplied water volumes, sharp reduction of the time for deteremining of the leaks, reduction of the time for reaction, a lot better opportunities for analysis and prioritiziation of the DMA zones with high losses, as well as tracking the tendencies for consumptions and leaks of each zone
In the invetsment program of the company is planned the purchase of such type of software in 2008.

6.3.3. Database for calculation of the unmeasured authorized consumption – current condition, implementation

- *Billed unmeasured consumption of water Q3.2*); -

In case of no installed individual meters or faulty ones in the properties of the customers, the monthly consumed potable water volume is determined and billed as

per the provisions of art.39, para. 5, item 1 and para 6 of Ordinance 4 of the MRDPW. Until water meters are installed, which meet the requirements; the base water volumes are increased every quarter by 1 m3 for every inhabitant.

The database for the calculation of the unmeasured authorized consumption is the customer information system SAP IS-U, which includes also the meter reading and billing processes. One of the main changes related to the implementation of the new software is the way for determining the monthly base volume, and namely – the monthly base volume, which is calculated for customers without individual meters or faulty ones, depends on the number of days in the billing period. More detailed information about the system is contained in item 6.2.10 of the Technical Part of the Business plan.

- *Unbilled unmeasured water consumption Q3A.2;*

The unmeasured consumed water volumes for process needs are calculated in line with the following approved methods:

Activity	Water consumption – way of reading (m3)	Calculation method
Rila water main	Specific water consumption versus the duration	Calculated versus the consumption and period
Impounding structures	Specific water consumption versus the duration	Calculated versus the consumption and period
Reservoirs	Water consumption versus the total volume of the reservoir	Calculated versus the volume of the reservoir
Water supply disconnection	Calculation of water consumption at draining/washing and rehabilitation of sections of the water network at water supply disconnections	Calculated versus diameter, pressure and duration at draining/washing
Operative civil works on the network	Calculation of water consumption at draining/washing and rehabilitation of sections of the water network at performance of civil works on the network by the Water Network Control and Management	Calculated versus diameter, pressure and duration at draining/washing
Investment civil works on the network	Calculation of water consumption at draining/washing and rehabilitation of sections of the water network at performance of civil works on the network by the Capital Investments Directorate	Calculated versus diameter, pressure and duration at draining/washing
Technological water 'Sewerage'	Water consumption versus the total duration of the functioning of the pump	Calculated versus diameter and consumption of the nozzle and duration of the work of the pump
Fire extinguishing needs	Protocol from the Sofia Directorate Fire Safety and Emergency for the water consumed by the used hydrants	N/A

The data for the monthly consumptions are maintained in a register from the beginning of 2013.

6.3.4. Database for the consumed electric power - current state, implementation

Current state:

Water supply to customers

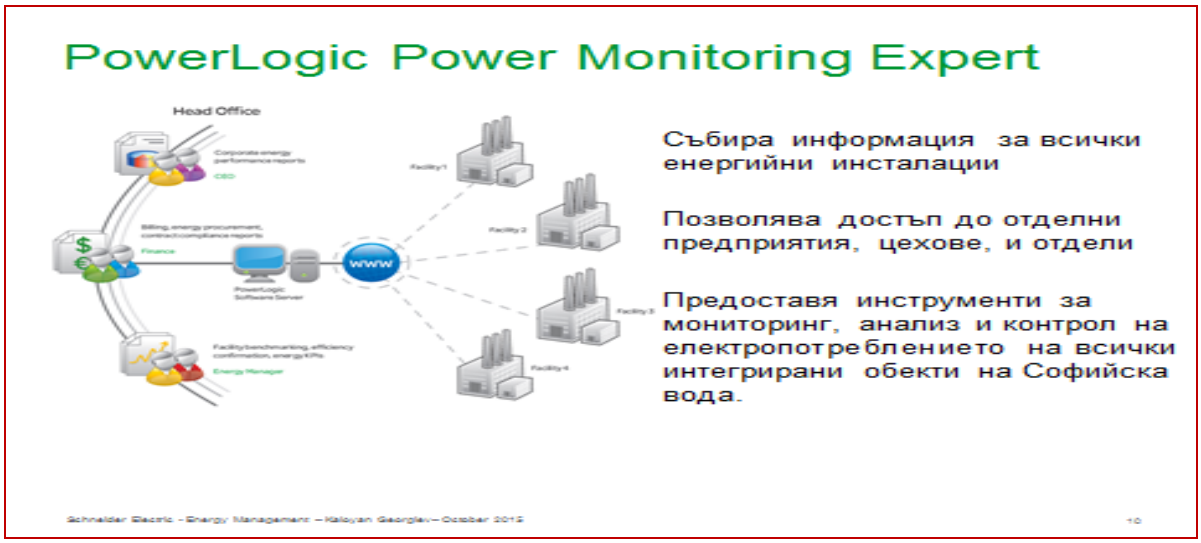
All electric power meters for measurement of active and reactive power on the basis of which electric power is paid, are property of the power distribution company. The main database is collected from the sent e-invoices by CEZ. The data from the consumption of electric power are included into an e-table in an Excel format. The table is stored on the mains server of the company. Only authorized employees are entitled to access. The control on the database is performed by Energy Efficiency head. On the basis of these data schedules are prepared for all sites which are on the liberalized electric power market and are sent to the provider.

Implementation:

In 2016 and 2017 for detailed survey a system for energy management is planned to be implemented in the potable water treatment plants. The system is structured in the following way:

- Installation of meters of electric power medium voltage of the main bushings at Bistritsa PWTP and Pancharevo WWTP.
- Installation of meters of electric power low voltage of all main panels low voltage in the treatment plants.
- Installation of meters of electric power low voltage of the main customers.

All data from the measurement devices will be collected on a base server. The base server will work with software SCADA ION 8 – an improved system for energy efficiency and energy flows management, based on the system for energy monitoring Power Logic ION Enterprise. The system has the capacity to be integrated in remote sites on the territory of the concession area.

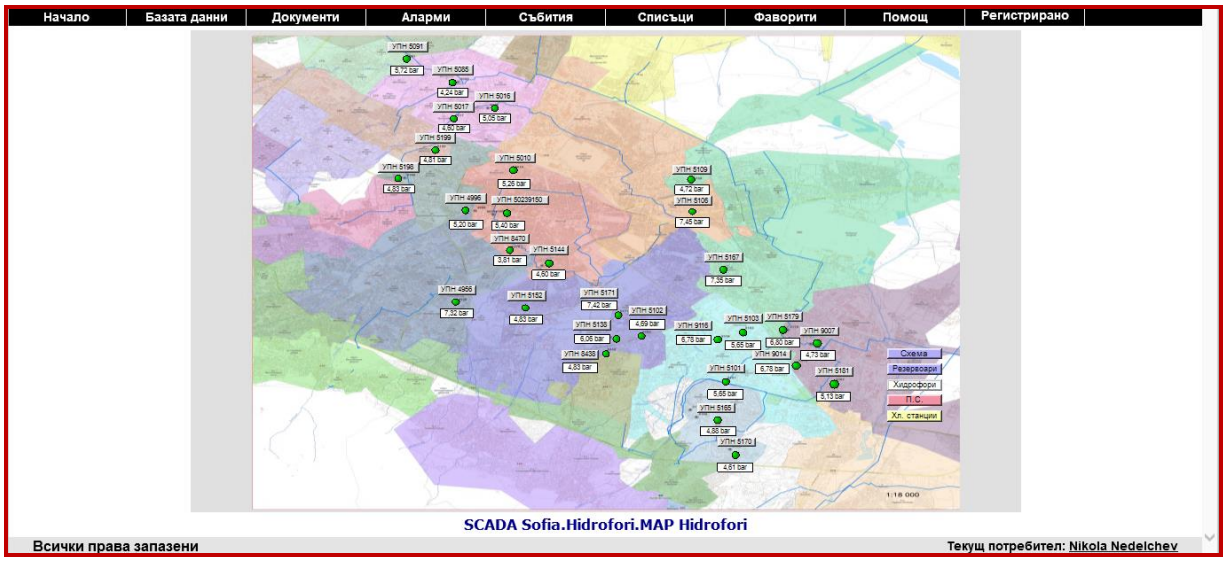


The base server may be accessed by means of the internal network of authorized persons. This allows for reports to be made for the consumption of electric power, the indicators of the quality of electric power to be monitored – load, consumption, working hours, energy conversion coefficient of pumps, ventilators and other quantities for each individual site. On the basis of this information an analysis may be

performed and decisions may be taken for improvement of the energy efficiency of the specific sites.

For the period of Business Plan 2017 – 2021 an expansion of the system for energy management of all pumping stations is envisaged. Through WEB applications within the internal network of the company, the system will be accessed by authorized persons - energy experts, the system management heads, financial experts, etc.

In 2015 and 2016 gradual installation of control electric power meters on the hydrophore installations started. Up to this moment they are installed on 29 sites. For each day a calculation is possible of the specific expenses for water supply to the customers and on basis of analysis priorities are placed on measurements for energy efficiency increase. For the period of the Business plan 2017-2021 it is envisaged that 150 of these sites will be equipped. There is an opportunity to control and manage these sites by SCADA system for water management.



The software has a powerful object database in real time with functional options for control, configuration and archiving of data. Clear SCADA is an open platform built on the basis customer/server. In package industrial standards are used – OPC, OLE, HTTP/XML and protocols for connection DNP3, Modbus RTU, Siemens S7, IEC 60870-5-101, IEC 60870-5-2014. The system is organized with View X customer SCADA – includes convenient interface for control of the processes with functional data, signals and registrations with an option for reports, tendencies and work with database. WEBX customer with limited functions accessed via Internet Explorer.

Activity on wastewater sewerage

The database for the consumption of electric power sewer pumping station Novi Iskar, sewer pumping station Iliyantsi and sewer pumping station Gorublyane is based on the database of the sent e-invoices by the power distribution company. The data from the consumption of electric power are included in e-table in Excel format. The table is stored on the main server of Sofiyska Voda. Only authorized employees

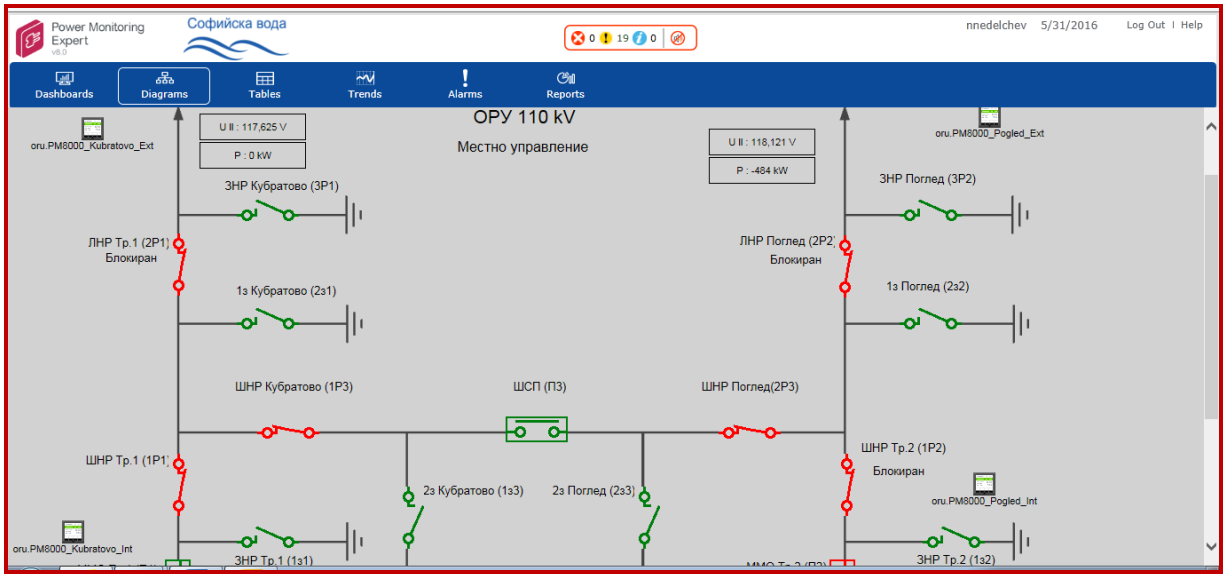
are entitled the right to access. The control on the database is exercised by Energy Efficiency Head. For the period of the Business Plan it is envisaged that all sewer pumping stations will be connected to the system for energy management. Sewer pumping station Benkovski is connected with WWTP Kubratovo and the database for the electric power consumption is stored in the system for energy management in WWTP.

Activity for wastewater treatment

In WWTP in 2008 a system for energy management is built which has been continuously developed throughout the years. The system is structured in the following way:

- The incoming and supplied high voltage electric power of the main bushings at WWTP is measured
- Medium voltage electric power consumption of closed distribution panel 6kV for all main processes is measured
- The electric power consumption of the individual panels low voltage is measured within the main processes
- The electric power consumption of the individual machines and equipment is measured

All data from the measurement devices are collected on a base server. The base server works with software SCADA ION 8 – an improved system for energy efficiency and energy flows management based on a system for energy monitoring Powe Logic ION Enterpirse.



The database is accessible through the internal network of the company and for each customer (energy experts, technological experts, shift head) user access is created. In such a way every person can on his/her own configure requests for different tendencies and reports of interest to him/her and the information is received in real time.

In SQL database all data for the consumption and production of electric power are registered. The registrations are done on periodical basis of 15 minutes. In the database all main parameters are registered for the quality of electric power such as electricity, voltage, medium and Instantaneous powers, total harmonic distortion, etc The database is archived on a monthly basis and on an external carrier in order for the security level to be increased.

In the database data are registered for occurred emergency events – date, hour, and type of the event.

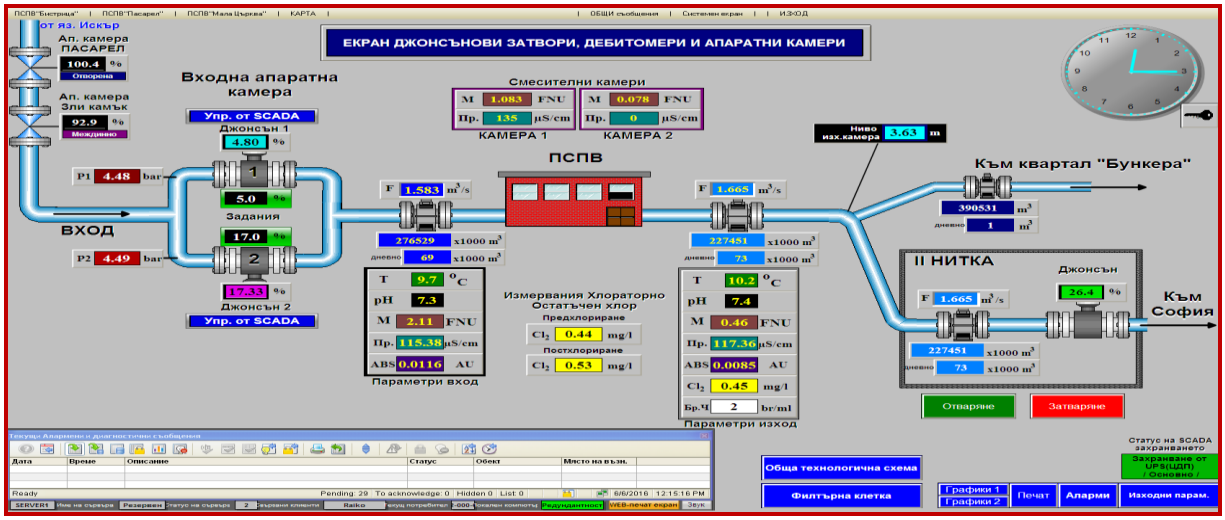
The main database is used for preparation of load schedules for the individual customers by factories and preparation of schedules for consumption of electric power of the entire station and their sending to ESO. An analysis is performed on the consumption in order to decrease the non-balances.

The main commercial measurements of electric power of the two bushings in WWTP are property of NEC AED. The data are sent remotely in ESO. On the basis of these data e-invoices are sent which are transferred in e-tables Excel and are stored on a server of Sofiyska Voda.

6.3.5. Database with the measured water volumes at the inlet of PWTP – current state, implementation

The measurement of the water inflowing in Bistritsa PWTP is performed through ultrasonic flow meters located on two measurement points – Equipment Chamber Porkolitsa and equipment Chamber PWTP Bistritsa. For visualizing the chart below, a current screen is presented on the local SCADA system for the measured quality and quantity indicators.

Construction of a new flow meter in the easement of the incoming water main is planned. The location of the new water meter shaft is considered with technical specifications.



The measurement of the inflowing water flows in PWTP Pancharevo is also performed in remote measurement points along the route of the impounding water mains. The installed and registered in basin directorate flow meters of the three inlets of PWTP Pancharevo are:

- The main inlet from Passarel HPP (Passarelski water main) - type Moni Sonic 4600 /Badger Meter, installed on the two pipes on the bridge channel over the river of Iskar at Kokalyane
- The first from peak emergency connection from HPP Kokalyane – type AFLOT UF, installed in Equipment chamber Kokalyane
- Second reserve from Iskarski water main – brand Siemens, installed in equipment chamber Vrah-13.

In addition to them, in PWTP Pancharevo on the common section of the incoming channel (after the three inlets) immediately before the distribution channel for the clarifiers in the specified flow meter shaft by means of ultrasonic flow meter for found leaks, the inflowing water is measured in the station.

For the purpose of visualization of the inflowing water flows of the scheme a screen is presented from the water supply SCADA system.

The measurement of the inflowing water volume in PWTP Pasarel is realized by means of magnate-inductive flow meter Siemens located in machine room and installed in incoming pipe immediately in front of the filters. For the purpose of visualization of the scheme, below a screen of the general technological scheme of Passarel PWTP is presented.

6.3.6. Database with the measured volumes at the inlet WWTP – current state, implementation

The data for the measured water volumes at the inlet WWTP Kubratovo are registered in SCADA system where they are systematized and summarized in database.

6.3.7. Database of concluded and fulfilled connection contracts – current state, implementation

The signing of preliminary agreements by SV AD, with which the company is engaged to connect properties to the WSS system, is a legal requirement pursuant to art. 143, par. 1, it. 3 of the Spatial Development Act and Ordinance No. 4 on the Terms and Conditions for Customer Connection and for the Use of WSS Systems. The preliminary contract settles the relationship between the company and the customer in the process of complying by the company with the investment project in the part concerning water service connections and/or sewer service connections. The fulfillment of the obligations under this contract is a necessary prerequisite for the conclusion of an agreement for connection of properties and customers of water to the water supply and/or sewer systems and for granting the services water supply.

The signing of connection contracts by SV AD, with which the company becomes engaged for the connection of properties to the WSS systems is a legal requirement pursuant to art. 84, par. 2 of the Spatial Development Act and Ordinance No. 4 on the Terms and Conditions for Customer Connection and for the Use of WSS Systems. The subject of the connection contract is the actual connection to the water supply and/or sewer systems located on the territory of the MoS via (a) service connection(s).

All concluded agreements (preliminary and for connection) for a given property between customers and the company are entered in the Geographic Information System of the Company.

The information on the current state in the connection process to the WSS network is entered into the SAP program.

6.3.8. Data base of the positions and the responsibilities of the staff of the Water operator – current state, implementation

The positions list is the labor standard that regulates the job structure of the staff in the company. It is developed as a summarized table based on the organizational and managerial structure of the company.

In the basis of the positions list stands the organizational listing of the titles of the positions in the relevant structural units, the code for each position in the National Occupational Classification, and the approved number of positions.

The position list is signed by the Human Resources Manager and is approved by the CEO of the company. The structural changes, the changes of the titles, etc. require a change the current positions list.

In accordance with the positions list the job descriptions are developed and approved as main documents in which the role and the responsibilities of the position are described. The job description is being developed by the relevant supervisor, agreed with the HR department and approved by the CEO of the company.

The HR department maintains a database and keeps the actual position list and job descriptions.

6.4 ANALYSIS WITH REGARD TO THE ACHIEVEMENT OF KPI 14A CONNECTION TO THE WATER SYSTEM

The average number of customers who requested connection to the water system, in the period 2011-2015 is slightly above 300 customers per annum. The consequences from the financial crisis from 2008/2009 and the subsequent drop in the investments in the construction sector can be clearly seen on the chart for the requests supplied for the period 2009-2015.

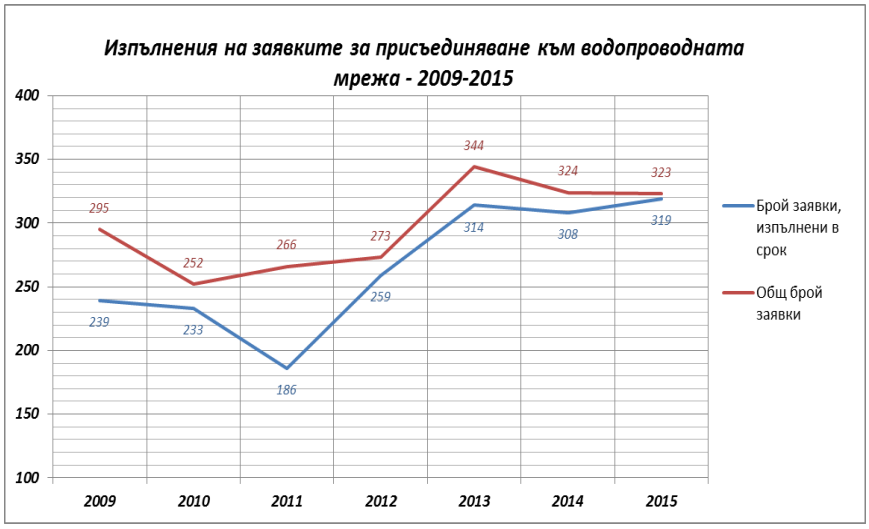
Requests for connection to the water network 2009 - 2015

323 requests for connection to the water network were received in 2015, and in the long-term plan, as a result of the improved economic climate in the country, as well as the occurred slight boom in the construction sector, it is expected the customers wishing to connect to the water system to increase to a certain extent.

Requests for connection to the water network 2015 - 2021

The fulfillment of the requests for connection within the determined deadline is improving constantly regardless of the fact that the reasons for the failure to fulfil them most frequently is out of the competence and responsibilities of the Company.

Fulfilment of the requests for connection to the water network 2009 - 2015



Blue – number of requests fulfilled within the deadline; red – total number of requests

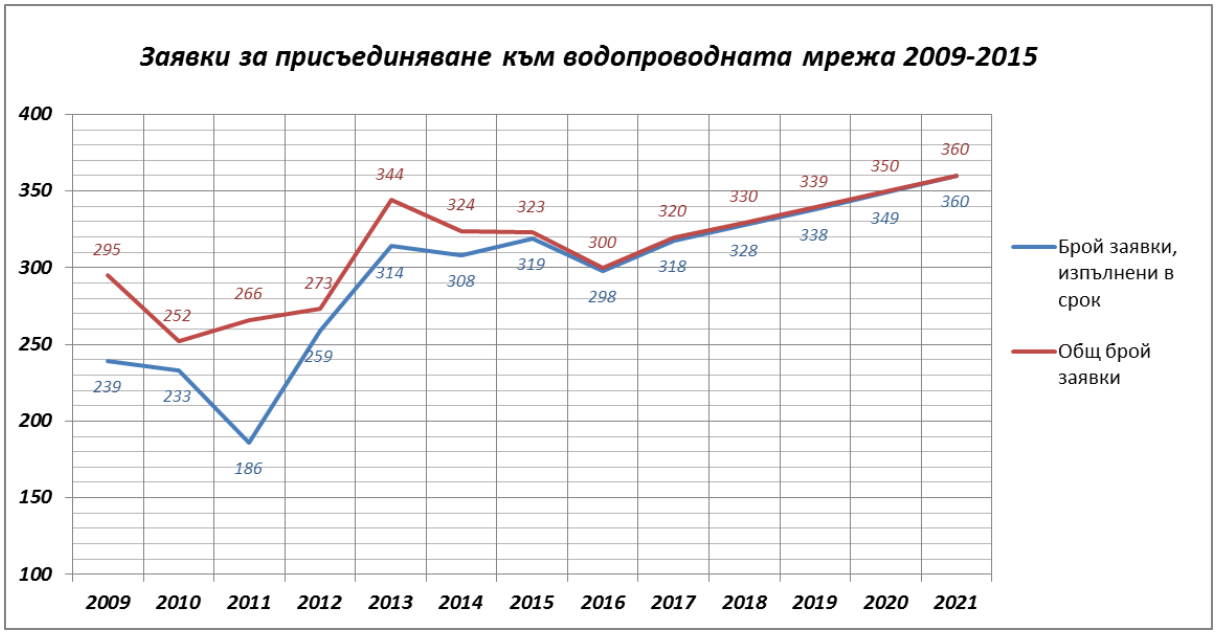
The most frequent reason for the delay of the fulfilment of a given request for connection remains the need of concluding contracts for transfer of the guarantee on the newly laid road surface by the contractor to Sofiyska Voda and concluding individual contracts for guarantees on the restoring of the damaged road surface with the Municipality of Sofia. The needed technological time for the conclusion of contracts for guarantee or transfer of guarantee on the section which is to be damaged varies from several days to a few weeks and it is fully out of the control of the Company.

In addition, the approval of the schedule for the implementation of the activities, as well as the approval of the project for temporary traffic organization, especially in the periods of intense construction activities on the territory of the MoS, also leads to an increase in the time for implementation, and the control on this process does not depend on Sofiyska Voda.

In big part of the cases, the customers themselves do not provide the possibility of performing the connection. Most frequently the reasons are the lack of construction preparedness, lack of constructed water meter shafts, frozen construction sites, impeding the access to the site due to stored materials, etc.

Regardless of the above factors, the forecasts of the Company are that at the end of the next regulatory period, the long-term indicator for the connection to the water systems will reach the levels set in the relevant Ordinance.

Requests for connection to the water network 2009 - 2015



Blue – number of requests fulfilled within the deadline; red – total number of requests

6.5. ANALYSIS RELATED TO THE IMPLEMENTATION OF KPI14B CONNECTION TO THE SEWERAGE SYSTEM

Up to 2015 the company performs over 99% of the submitted requests for connection within the normatively set 30-day period for the customers who preparedness for construction activity. The assumptions are that the tendency towards gradual increase of the requests for construction of the new connections from the company at the expense of the built ones by private investors will be kept and the company will continue to aim at their construction within the deadline.

The requests for connection to the sewerage network are registered in the customer database SAP after which through an interface, in the software application Pegasus a signal is generated for check of the technical parameters and assigning a physical construction of the sewer service connection (SSC). In case the customer himself performs the construction of SSC and requested only the presence on part of the company, no assigning is performed for construction of the sewer connection. The reporting data for the built by Sofiyska Voda JSC sewer service connections are traceable through the mentioned database.

7. PRODUCTION PROGRAM

7.1 ANALYSIS OF THE PRODUCTION PROGRAM

The main technical and technological parameters of the WSS systems for water supply, sewerage and wastewater treatment regarding the activities in production program of the company are described in it. 1.2, 1.3 and 1.4 to Section I of this document. The supplied, drained and treated volumes envisaged in the production program are determined on the grounds of the following:

- Analysis of the existing and the estimated level of consumption of the WSS services for the period 2009-2015 including domestic, commercial, budget, industrial and other customers

In the analysis are presented the consumption trends by categories of customers on the basis of which are prepared estimates for the future consumption within the regulatory period 2017-2021.

At the preparation of the estimates is taken into consideration the increase of the serviced population by the forecasts of the NSI, the reduction of commercial water losses, the construction of new assets for sewerage and wastewater treatment.

Detailed information about the analyses of the existing and estimates of the future water consumption is presented in item 1 to Section IV of this document.

- Analysis of the water losses of the WS systems – detailed information for the analyses made for the total water losses is presented in it. 2.7. to Section II of this document

- Measures for water losses and estimated levels over the regulatory period 2017-2021 – detailed information about the planned measures for water losses reduction and their estimated levels is presented in it. 7 to Section V of this document

On the grounds of the analyses of the future consumption, the envisaged measures for reduction of the water losses and their estimated levels for the regulatory period 2017-2021 in the production program of the company is set reduction of the supplied, drained and treated water as per the stated in Report No 4 to the e-model.

On the basis of the envisaged reduction of the water supplied at the inlet of the system is estimated the effect on electricity consumption in the process of potable water treatment, which is presented in it. 5.1 to Section II from this document.

In the production program is set sludge utilization, generated at wastewater treatment by their use in agriculture at 100%. Detailed information about the methods for treatment, the procedure and way for utilization of sludge is presented in it. 4.4 to Section II of this document.

7.2. INFORMATION FOR WATERSUPPLY AND SEWERAGE SYSTEMS

7.2.1. Description of the water source

Description of the water sources is provided in item 1.2.1 from the existing document.

7.2.2. Permits for water abstraction – N. Data of issuance and validity period

№	Type of water source	Name of the source	Permit for Water sue	
			№ and in effect since	Deadline of validity
1	Dam	Dam Iskar	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
2	Bent	Kokalyane	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
3	River catchment	Vladajska reka I	11110044/28.12.2010 and Decision № ПВ2-00204/10.04.2013	01.01.2031
4	River catchment	Vladajska reka III	11110044/28.12.2010 and Decision № ПВ2-00204/10.04.2013	01.01.2031
5	River catchment	Zhelyava	100767/14.01.2005	05.10.2025
6	River catchment	Kyunetsa	11110044/28.12.2010 and Decision № ПВ2-00204/10.04.2013	01.01.2031
7	Catchment	Gospodarev kladenets	11510657/07.07.2011	07.08.2021
8	River catchment	Kameno Zdanie (Boyanska Reka)	11110044/28.12.2010 and Decision № ПВ2-00204/10.04.2013	01.01.2031
9	Catchment	Pasha bunar	11510656/07.07.2011	08.08.2021
10	Catchment	Svetena voda	11510850/18.05.2013	18.05.2023
11	Catchment	Three well - 3 nos catchments	11510654/07.07.2011	08.08.2021
12	Catchment	Turska Vada - 4 Catchment a	11510795/18.009.2012	18.09.2022
13	Catchment	Selimitsa - 4 Catchment a	11510659/07.07.2011	07.08.2021
14	Catchment	Klisura (Varlo Usoe)	11510794/18.009.2012	18.09.2022
15	Catchment	Shkarpata	11510658/07.07.2011	07.08.2021
16	Dam	Dam Beli Iskar	01410012/28.12.2010 and Decision №11/18.01.2016	31.12.2020
17	River catchment	Preka reka (Cherni Iskar)	01410012/28.12.2010 and Decision №11/18.01.2016	31.12.2020
18	River catchment	Levi Iskar	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
19	River catchment	Beli Iskar-water catchment	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020

20	River catchment	Levi Iskar (emergency)	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
21	River catchment	Cherni Iskar	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
22	River catchment	Preka reka (Beli Iskar)	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
23	River catchment	Derkovo dere	01410012/28.12.2010 and Decision № 11/18.01.2016	31.12.2020
24	River catchment	Vitoshka Bistritsa	11110044/28.12.2010 and Decision № ПВ2-00204/10.04.2013	01.01.2031
25	River catchment	Yanchovska Reka	11110044/28.12.2010 and Decision № ПВ2-00204/10.04.2013	01.01.2031
26	River catchment	Zheleznitsa reka	11110044/28.12.2010 and Decision №ПВ2-00204/10.04.2013	01.01.2031
27	River catchment	Pavlovitsa	01410012/28.12.2010 and Decision №11/18.01.2016	31.12.2020
28	River catchment	Lopushnitsa	01410012/28.12.2010 and Decision №11/18.01.2016	31.12.2020
29	catchment	Zad mura	11510655/07.07.2011	08.08.2021

7.2.3. Sanitary-restricted areas

In the table format the already permitted sanitary restricted areas are indicated and the ones envisaged be building and accepting in the period 2016-2021

№	Type of water sources	Name of water source	Order for establishing SRA	Accepting SRA	Planned for constriction and accepting SRA year
1	Dam	Iskar Dam	Order № РД-577/08.09.2008 and Order №РД-410/09.06.2015	By protocol dated 22.10.2015	
2	Bent	Kokalyane	Order № РД-582/19.07.2013		2 016
3	River catchment	Vladajska rekaI			2 016
4	River catchment	Vladajska reka III			
5	River catchment	Zhelyava			2 018
6	River catchment	Kameno Zdanie (Boyanska Reka)			2 016
7	Dam	Dam Beli Iskar	Order No СО3-47/12.03.2005	By protocol dated	

				04.02.2014г.	
8	River catchment	Preka Reka(Cherni Iskar)			2 017
9	River catchment	Levi Iskar			2 019
10	River catchment	Beli Iskar-water catchment			2 019
11	River catchment	Levi Iskar (emergency)			2 018
12	River catchment	Cherni Iskar			2 019
13	River catchment	Vitoshka Bistritsa	Order No CO3-11/03.06.2004	By protocol dated 25.06.2014г.	
14	River catchment	Zheleznitsa reka			2 018
15	River catchment	Pavlovitsa			2 021
16	River catchment	Lopushnitsa			2 020

7.2.4. Facilities for treatment of potable waters

The description of the facilities for potable water treatment is presented in item 1.2.2

7.2.5. Permits for discharge – No. date of issuance and period of validity

No	Site	Permit	Actual version	Application	Validity
1	PWTP Bistritsa	13120034/ 10.09.2009	№ 1632/ 25.05.2015	Permit for use of water site (Kalna river) for discharge of treated waste water from PWTP Bistritsa	12.07.2021
2	PWTP Pancharevo	13720007/ 14.08.2009	№ 1631/ 25.05.2015	Permit for use of water site (Kosanin dol gully) for discharging of technological waste water from PWTP Pancharevo	03.09.2021
3	WWTP Kubratovo	13140074/ 08.08.2008	№ 1295/ 14.04.2014	Permit for use of water site (Iskar river) for discharge of treated waste water from WWTP Kubratovo	11.08.2020
4	PWTP Passarel	13720019/ 06.02.2012	№ 13720019/ 06.02.2012	Permit for use of water site (gully) for	06.02.2018

				discharging of waste water in surface water for operation of PWTP Passarel	
5	LWWTP Voynegovtsi	13110102/ 10.03.2010	№ 1353/ 03.07.2014	Permit for use of water site (Voineshka river) for discharging of waste water in surface water from a site in a process of designing/ construction - LWWTP Voynegovtsi	Until the LWWTP has issued Permit for put into operation

8. REPAIR PROGRAM

8.1. WATER SUPPLY

8.1.1. Organization and planning the work of submitting a signal until repairing of the failure – description of the process

Registration of signals related to servicing the water main and sewerage network is performed through the software application in which all mandatory parameters are entered (address, person for contact, description of the problem and other useful information) as well as the entire additional information which would be helpful during the performance of the field check.

The sources of registration of signals may be internal – teams and departments in the structure of the company, and external – customers, institutions, controlling bodies.

All signals are registered only upon providing the entire necessary information – exact address, description of the problem, data for the customer. Depending on the nature of the issue, the signal is directed towards the respective employees in charge. When a signal is related to another existing signal, it is obligatory to enter the identification of all related signals.

Processing of registered signals

Each signal registered in the software application, is transferred by the coordinators on shift in Control Center to the respective employee in charge for the sewerage and water supply servicing the zone which includes the address of the signal.

Each signal is checked on filed by an employee before assigning the work on an internal team or subcontractor. The employee who is in charge for the region by his/her own judgement may require assignment of additional check of the same signals.

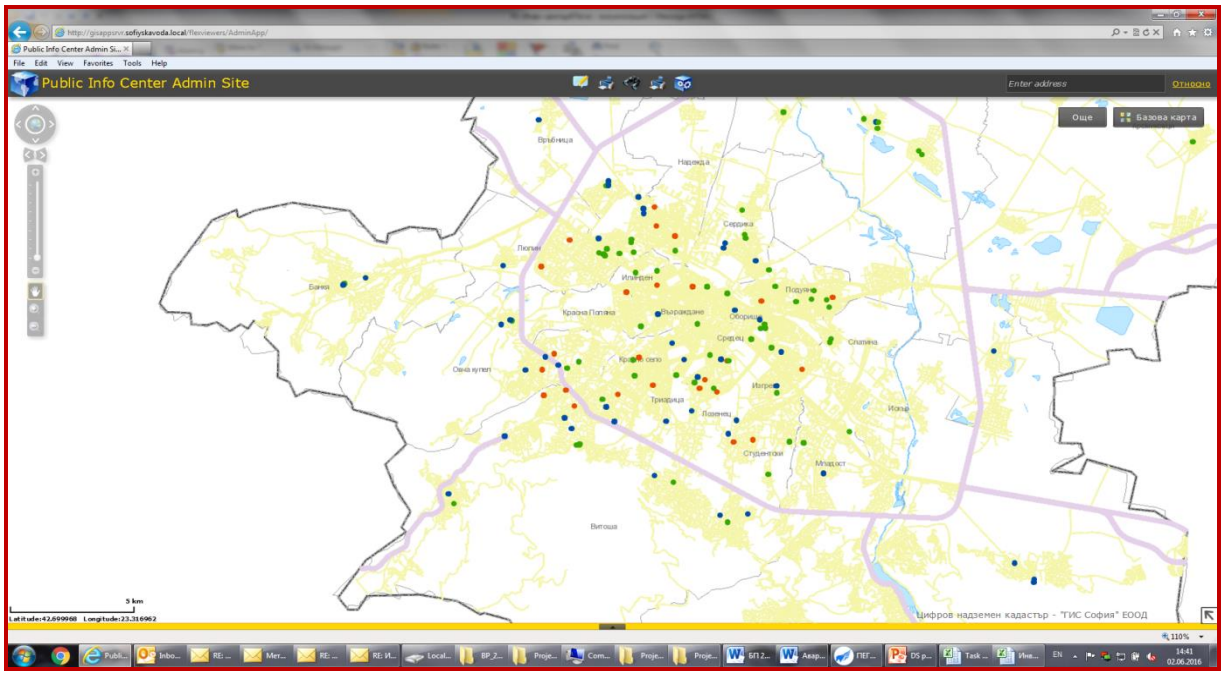
Reporting of the performed checks and assigning

The reporting of the performed checks is performed immediately via telephone after completion of the check. After preparation and approval of the assigning document by the respective head, the assigning is transferred to the respective team or the subcontractor who on the basis of the document sendS information when the respective work will be performed through preparation of a schedule consistent with the deadline determined in the assignment which is registered in the software and following this all interested parties are informed.

After performing the assignment, in order for the work of the team or subcontractor to be accepted, a team of Sofiyska Voda JSC accepts the work. After accepting the work, the team or company send reporting information about the performed work which is registered in the software application, In case, in relation to a given work, road cover has been destroyed, after its restoration once more a reporting form is sent which contains information on the square meters, type of road surface and date for restoration which is registered in the software product and by which it is considered that the work has been completed.

The entire information after receiving the signal, through the assigning and reading is registered in the software product Pegasus.

In 2016 creation of an opportunity for visualization of the made assignments of the repair activities on the map, which presents also the progress in the implementation of each assignment, is planned.



The assigning of the emergency repair activities in PWTP is performed by the head of the PWTP or authorized by him/her authorized persons.

As assigned emergency work is considered this work for which an assignment letter has been received or a table in electronic format to Electric and Mechanical Maintenance – South zone. The assignment of work to the technical members is realized by means of assignment on part of the managing units or directly by Electric and Mechanical – South Maintenance Manager.

After performing the work, a form is filled in for 'Emergency Maintenance'. The work is accepted by the respective head of Unit. After accepting the emergency repair works the assignor reports in the assigning table the repair activities as being performed.

The activities on maintenance of the assets in WWTP are specified by 'Regulations for the service level' signed by Senior Manager WWTP and Senior Manager Electric and Mechanical Maintenance. The regulations include the maintenance of all electromechanical assets. The planning maintenance of all assets is performed according to an approved schedule.

8.1.2. Measures and technologies for repairing the failures

The company has a set of highly specialized technical equipment for diagnostics of the state of the machines and facilities for water supply. It also has highly-qualified experts in the area of electromechanical maintenance.

According to a prepared plan schedule preventive activities and maintenance of all electromechanical facilities are performed. The end goal of these activities is decrease of the emergency maintenance. The forecast maintenance and diagnostics is one contemporary approach for assets management in Sofiyska Voda JSC . The preventive maintenance and prevention is applied for all facilities in the potable water treatment plants, the pumping stations along the water supply network and the pumping-hydrophore installations.

8.1.3 Using of internal resources

For the purposes of the emergency maintenance of the network the Concession area is split into three zones, one of them is maintained by Sofiyska Voda's internal teams. For this purpose an in-house department Failures and Maintenance is in place in the structure of the Engineering and Construction Works Directorate. The territory serviced by the Department is 49.3% of the Concession area but the emergency events in the three zones are comparable by number, i.e. it can be assumed that 1/3 of the repair works are performed with internal resource.

The in-house department Failures and Maintenance of Sofiyska Voda has 18 teams from which two are the service teams (one for the performance of the civil works without digging and one team of welders), one asphalt team and one team for pavement works, and the remaining teams are specialized in repairing water failures. In order to decrease the hours for overtime work, the emergency teams work with

different work schedules. Thus every day the Company has on field 9 teams on average, working to repair failures. At weekends and on non-working days only two teams are at work and during these days only the most urgent repairs are performed.

The prepared and delivered to the EWRC in 2014 detailed comparative analysis of the costs for emergency maintenance of the water network for the contractors and internal teams showed that the maintenance of the water network within the entire Concession area with internal resources is not economically more favorable than using contractors. For 2015 a slight exceeding of the costs for repair activities for the contractors was observed as compared to the costs of the internal teams but they remain comparable, and if all required capital and indirect costs are taken into account in order to ensure the service within the entire Concession Area by the internal teams, the costs for subcontractors will turn out to be more cost effective.

The contracts with the contractors for emergency maintenance of the water network do not provide for exclusivity in the specific zone. The existence of internal resources for the repair of failures on the water network gives security and flexibility to the Company in case of possible inability/refusal on behalf of the contractors to perform the works assigned within their zone. Through setting up internal teams for repairing failures on the water network, the Company has ensured protection against cartel activities between companies-contractors, as well as against their possible sudden withdrawal.

8.1.4. Using of sub-contractors

In the process of maintenance of WWTP also subcontractors are used related to the maintenance of specialized assets for which the repair activities need to be performed in specialized licensed service buildings. Some of the main activities granted to subcontractors:

- Maintenance of submergible pumping units
- maintenance of hoisting equipment
- rewinding of electric motors
- maintenance of processing devices
- maintenance of boilers

Repair program PWTP and Chlorination station

In the operational budgets of PWTP and chlorination stations a number of activities and events are envisaged for maintenance of treatment facilities, buildings and technical infrastructure (site WSS networks, roads, alleys, fences, etc.) according to the normative and sanitary and hygiene requirements. On annual basis ongoing and emergency repair activities are envisaged in order to maintain their normal functioning, technical good state and suitability. The potable water treatment plants include a total of 120 facilities (including inlet chambers, impounding sewers/pipes, distribution sewers, mixing chambers, vessels for storing reagents, clarifiers, filters,

closed channels/pipes for filtered water, reservoirs for treated water and outlet chambers). The total number of buildings in PWTP and the chlorination stations is 50. In the 60 gravity sand filters and the 2 pressure filters there are a total of 8,408 m3 quartz sand which in the process of treatment get polluted, get ruined in the process of suffusion and gradually get moved out of the filters. It is necessary to add new quartz sand on periodical basis.

Surrounding the treatment plants there are separated sanitary restricted areas with fences, site roads and alleys, site WSS network.

The main activities on ongoing and emergency repair activities include: processing of fissures and fugues, restoration of fallen cement and revetment, restoration of worn out and faulty elements, preparation and painting of metal surfaces, restoration of covers, parapets, transition bridges, etc.

The main activities on the repair activities in buildings include: mending up and plastering up of broken-down plastering; preparation and coloring of walls, ceilings, joinery installation and metal articles; replacement of internal flooring and wall covering, covering and revetments, repair activity on the internal WSS network with adjoining sanitary devices and fittings, replacement of broken glass, etc.

According to preliminary prepared plan schedules prevention activities and sanitary hygiene activities (mechanical and reagent treatment and disinfection) are performed on all treatment facilities.

The grass areas in the sanitary restricted areas are maintained according to the requirement of Fire Safety and Civil Protection Service and the Regional Health Inspection.

The envisaged number of repair activities on facilities, buildings and technical infrastructure are provided in the list ‘Repair program’ respectively in item 1.11 and item 1.7. The preventive and sanitary-hygiene activities are given in item 1.11 and the necessary consumables for 5 process water facilities“(including 3 sludge cleaners and 2 filter presses) and quartz sand for periodical adding of 60 gravity sand filters and 2 pressure filters are given in item 1.13 from the same list.

For the purposes of failure fixing along the network the concession area has been divided into three zones, two of which are already maintained by subcontractors. Failures in the three zones are comparable in number, i.e. it may be accepted that around 2/3 of the repair activities are done by subcontractors.

The subcontractor contracts for failure repairs of the water supply network are concluded for a period of 2 years, wherein requirements to the experience, number and qualifications of the technical stall, equipment and machinery the companies dispose with are included, to guarantee that the selected subcontractors will comply with the provided for in the statutory provisions and those of the internal regulatory documents of the company standards for reaction time, duration of planned interruptions, quality of the work done, flushing and disinfection of the water supply

network, safety and health at work and environment protection. Subcontractors are selected through public procurement procedures pursuant to the Public Procurement Act.

The prepared and provided to the EWRC in 2014 detailed comparative analysis of the cost of failure maintenance of the water supply network for subcontractors and for internal teams showed that these subcontractors do not exceed the costs of internal teams of the company. For 2015 a slight increase of the expenses on repair activities is visible for subcontractors compared to the expenses on internal teams, but both remain fully comparable taking into consideration all capital and indirect expenses, and in order to provide servicing of the whole area covered by the concession by internal teams, the expenses for subcontractors will prove more cost-worthy.

Contracts with subcontractors for failure repairs of the water supply network do not provide for exclusivity in the specific zone, which allows a flexible reaction if necessary. Through the creation of internal teams for fixing failures on the water supply network the company has ensured protection against cartel-formation by the subcontractors, as well as against their possible withdrawal.

In connection with it. 8.1 of letter of the EWRC No B-17-44-25 (with No CB-1677/19.08.2016) and after conducted discussion on 11.11.2016 below is submitted additional information as per it. 7.1. of the protocol from the conducted service in connection with the expenses for *Other operational repairs for water supply* (*line 1.13. from Report No 8*):

Line 1.13. from Report No 8 consists of the following elements:

Table 1

№	Type of operational repair / Operational repair unit	Volume (unit of measure)	Nos.					Total costs of sites (k BGN)						(k BGN)
			2017	2018	2019	2020	2021	2017	2018	2019	2020	2021		2015
	WS Sofia													
1.13.	Other operational repairs for water supply	nos.	1 919	1 919	1 919	1 919	1 919	528,54	551,31	560,03	567,32	577,56		174,93
	WS Non-potable													
1.13.	Other operational repairs for water supply	nos.	60	60	60	60	60	19,71	20,73	20,37	20,31	20,05		5,50
	WS Beli Iskar													
1.13.	Other operational repairs for water supply	nos.	2	2	2	2	2	3,75	3,75	3,75	3,44	3,75		0,00
			1 981	**1 981**	**1 981**	**1 981**	**1 981**	**552,00**	**575,79**	**584,14**	**591,06**	**601,36**		**180,44**

Table 2

Cost elements	Volumes (unit of measure)	Nos.					Total cost of the sites (k BGN)					(BGN)
		2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2015
materials 11 030 BGN hired services 900 BGN	nos.	1 441	1 441	1 441	1 441	1 441	11 931	11 931	11 931	11 931	11 931	11 931

Salaries and insurances 76 050 BGN corrected by 8.12 in accordance with the growth in 2017 compared to 2015 of the costs for FTE as per report No 5 cell AU32. In the following years the increase is by 20.4 compared to the previous year							82 222	83 903	85 613	87 358	89 143	76 050
Salaries and securities 40 482 BGN; Hired services 9 300 BGN	nos.	382	382	382	382	382	9 300	9 300	9 300	9 300	9 300	9 300
Salaries and insurances 40 482 BGN corrected by 8.12 in accordance with the growth in 2017 compared to 2015 of the costs for FTE as per report No 5 cell AU32. In the following years the increase is by 20.4 compared to the previous year							43 768	44 662	45 572	46 501	47 452	40 482
Materials 12 458 BGN; Hired services5 597 BGN	nos.	35	35	35	35	35	24 305	24 305	24 305	24 305	24 305	18 055
Materials 2 056 BGN; Hired services8 177 BGN	nos.	5	5	5	5	5	10 233	10 233	10 233	10 233	10 233	10 233
Materials 2 682 BGN	nos.	90	90	90	90	90	2 683	2 683	2 683	2 683	2 683	2 683
Materials 3 112 BGN; Hired services 3 764;	nos.	10	10	10	10	10	6 877	6 877	6 877	6 877	6 877	6 877
As per additional table– justification below	-	0	0	0	0	0	*336 654*	*357 869*	*363 598*	*369 445*	*375 410*	0
Materials 2 054 BGN; Hired services2 774;	-	10	10	10	10	10	4 828	4 828	4 828	4 828	4 828	4 828
On average the cleaning of one water catchment amounts to about 3 k BGN. The other repairs (replacement of elements from facilities, coating fencing walls and chambers, painting etc - from 1,400 to 1,800 BGN (labor, materials, transport)		8	8	8	9	8	19 200	19 200	19 200	17 600	19 200	0
		1 981	**1 981**	**1 981**	**1 982**	**1 981**	**552 001**	**575 790**	**584 140**	**591 061**	**601 361**	**180 439**

The additional expenses based on 2015 is due to the reporting since the beginning of 2017 of expenses as operational instead as capital – it consists of the following cost elements:

	2017	2018	2019	2020	2021
Additional cost (BGN):	**336 654,34**	**357 869,16**	**363 598,40**	**369 444,52**	**375 409,90**
Hydraulic model					
Salaries and insurance (2018 added expense for 1 new specialists – Technical coordinator)	119 262,21	137 295,16	140 095,98	142 953,94	145 870,20
Vouchers and insurances for the vouchers for amount of the vouchers exceeding BGN 60	10 160,21	10 472,21	10 472,21	10 472,21	10 472,21
DMA and PMA program					
Salaries and insurance	140 680,12	143 550,00	146 478,42	149 466,58	152 515,70
Transport	45 500,00	45 500,00	45 500,00	45 500,00	45 500,00
Vouchers and insurances for the vouchers for amount of the vouchers exceeding BGN 60	12 869,60	12 869,60	12 869,60	12 869,60	12 869,60
Materials (electric materials, tools, construction materials etc.)	2 193,00	2 193,00	2 193,00	2 193,00	2 193,00
Public transport cards	5 989,20	5 989,20	5 989,20	5 989,20	5 989,20
Total:	**336 654,34**	**357 869,16**	**363 598,40**	**369 444,52**	**375 409,90**

In short, the following expenses are transferred from investment into operational:

- Hydraulic model

As operational will be reported the following expenses:

- Expenses for remuneration of the personnel;
- Expenses for social securities and vouchers

- DMA and PMA program.

As operational will be reported the following expenses:

- Expenses for remuneration of the personnel, expenses for social securities and vouchers related to the operational maintenance of DMA and PMA;
- Expenses for transport , including fuel, lubricants, repairs etc.;
- Expenses for materials – el. materials, tools, construction materials etc.

The reason to report as operational instead of capital the above expenses since the beginning of 2017 are:

- Hydraulic model

The long-term project for establishment of a detailed hydraulic model of the water supply network will be completed at the end of 2016. The model is a basic tool for detection of deviations from the normal work of the network, simulation of the terminations of water supply, application of alternative water supply schemes, change of the velocity of water in the network etc. After completion of the activities for its establishing, the expenses of the department will be directed to the maintenance of the current condition of the model, calibration of already established zones, making simulations, determining deviations from the normal work of the network etc. In addition to the expenses stated above, in the costs (outside the repair program – such as costs for hired services) are included also the annual license for technical support of the software (14.4 k BGN), which is the basis for the establishment of the hydraulic model of the water supply network.

DMA and PMA programs

In 2016 the DMA and PMA projects will be completed in their main stage, as the expenses on subsequent activities in the next regulatory period will be directed mainly towards maintenance of the already constructed systems, current repairs of the measurement devices, improvement and optimization of the existing zones and measurement devices, as well as improvement of the measurement precision, and the activities of these units will be reported as operations. Personnel costs (remuneration, social security contributions and urban travel cards), transportation, phones and office supplies, use of telemetric systems were included into the costs.

Operational costs for the pressure management program include above all the operational maintenance of the PRVs, operational repairs of separate elements of the pressure reducers, actions on drainage and repair of existing shafts, service activities for preventive maintenance of the existing system of pressure reduction valves and other activities necessary for the maintenance of the system in good operational condition.

Regarding the requested clarification in it. 7.1. from the Minutes on the discussion that was held for the reported until that moment expenses for the projects for modelling, zoning and management of the pressure and what is envisaged in future as capital expenditures related to them – we provide the following clarifications:

Hydraulic model

The envisaged capital expenditures are for development of software tools for upgrade of the hydraulic model with connections to and from the rest of the databases in the company, related to the water supply network, as well as provision of automatic synchronization between them.

PMA program: The planned capital expenditures are for the following investment projects:

- Creating new zones with pressure management;
- establishment of new, local areas with pressure management
- Replacement of PRVs as part of the capital maintenance of the system

DMA program: The planned capital expenditures are for the following investment projects:

- Construction of water meter nodes for flange devices at all DMA water meters on water mains with a diameter less than Ø300 mm, incl. and/or water mains, which small water volumes pass through
- equipment for DMA – water meters and PRVs for connection to SCADA;

Replacement of measuring devices and loggers as part of the capital maintenance of the system.

The total capital expenditure of projects included in the relevant rows of Report 9 “Investment program” are as follows:

	2017	2018	2019	2020	2021	TOTAL
Hydraulic model	***10 000 BGN***	***10 000 BGN***	***10 000 BGN***	***10 000 BGN***	***15 000 BGN***	***55 000 BGN***
PMA program						
Dynamic pressure management	50 000 BGN	50 000 BGN	50 000 BGN	50 000 BGN	50 000 BGN	250 000 BGN
Creating new zones with pressure management	120 000 BGN	120 000 BGN	120 000 BGN	120 000 BGN	120 000 BGN	600 000 BGN
Replacement of PRVs as part of the capital maintenance of the system	90 000 BGN	102 000 BGN	120 000 BGN	138 000 BGN	150 000 BGN	600 000 BGN
TOTAL PMA	***260 000 BGN***	***272 000 BGN***	***290 000 BGN***	***308 000 BGN***	***320 000 BGN***	***1 450 000 BGN***
DMA програма						
Replacement of the type of the measuring small water mains or water mains with small volumes	132 712 BGN	118 420 BGN	118 296 BGN	118 178 BGN	118 146 BGN	605 752 BGN
Equipment for DMA – water meters and PRVs for connection to SCADA;	189 588 BGN	189 472 BGN	151 418 BGN	113 451 BGN	113 420 BGN	757 350 BGN
Replacement of measuring devices and loggers as part of the capital maintenance of the system	284 383 BGN	322 102 BGN	378 546 BGN	434 896 BGN	472 585 BGN	1 892 512 BGN
TOTAL DMA	***606 683 BGN***	***629 994 BGN***	***648 260 BGN***	***666 525 BGN***	***704 152 BGN***	***3 255 614 BGN***

To the value of the projects regarding the DMA and PMA programs are added also the part from expenses for remuneration of the personnel and the social benefits related to the implementation of the above projects.
The total sum on row “Zoning the water supply network – control measuring” in Report 9 – “Investment program” is formed as follows:

Zoning the water su[ply network - control measuring	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Program for zing the network for measuring (DMA)	606 683 BGN	629 994 BGN	648 260 BGN	666 525 BGN	704 152 BGN	3 255 614 BGN
Control measuring of the impounding structures to the main reservoirs	152 698 BGN	-	152 698 BGN	-	-	305 395 BGN
Control measuring at the inlet / outlet of the pressure reservoirs	-	160 000 BGN	-	-	-	160 000 BGN
Control measuring by strategic water mains	-	-	47 718 BGN	319 711 BGN	324 482 BGN	691 911 BGN
TOTAL	***759 380 BGN***	***789 994 BGN***	***848 675 BGN***	***986 236 BGN***	***1 028 635 BGN***	***4 412 921 BGN***

8.2. SEWERAGE

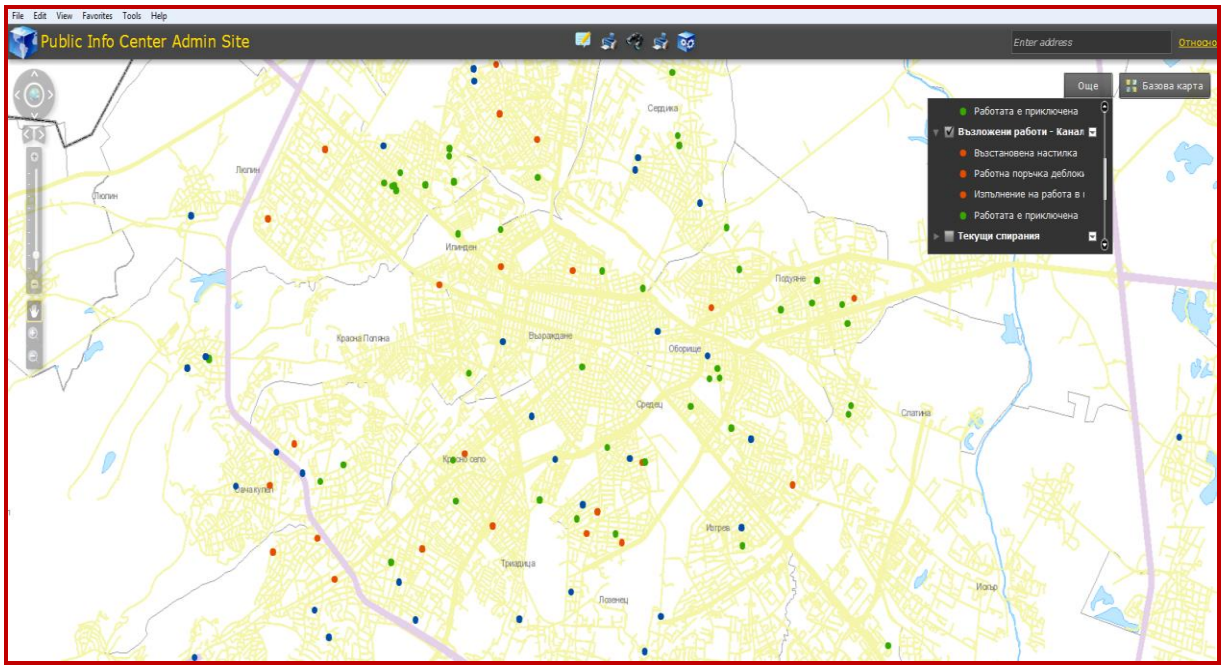
8.2.1. Organization and planning of the work from sending the signal until repairing the emergency – description of the process

The process is identical with the one described in item 8.1.1.

The zones for checking of the received signals for the sewerage network are defined as follows: Sewerage – zone Iztok 1, zone Iztok 2, zone Zapad 1 and zone Zapad 2. The territorial scope of the zones is indicated below:

Region	Zone
Sredets, Izgrev, Studentski, Mladost, Iskar, Slatina, Kremikovtsi, Pancharevo	Iztok 1
Vazrazhdane, Krasna Polyana, Lulin, Bankya, Ilinden, Vrabnitsa, Novi Iskar	Zapad 1
Ovcha Kupel, Krasno Selo, Triaditsa, Lozenets, Vitsoha	Zapad 2
Oborishte, Sedika, Nadezhda, Poduyane	Iztok 2

In 2016 creation of opportunity is envisaged for visualization of the performed assignments of the repair activities along the sewerage network on a map which presents also the progress in the implementation of each assignment:



8.2.2. Measures and technologies for repairing the failures

Sofiyska Voda JSC incessantly aims at providing the best possible technique for proactive and reactive repairing of issues within the sewerage network of Municipality of Sofia. In the proactive maintenance of the sewerage network for each year concrete goals are envisage for surveying the network and video recording of the current state.

In 2015 a chamber was purchased – a robot for surveying the necessary street sewers and sewerage mains (with diameter up to Ø90 cm).

In 2015 a team was organized for check on walkable sewers.

The technologies for repairing depend on the types of failures:

For clogging of the sewerage network a standard technology is used for flushing with water under high pressure, and the company has several types of machines for different diameters:

- Up to Ø400 – small sewer cleaning machines with system under pressure ½" – used mainly for sewer service connections, cleaning of connections of street water inlets, activities organized jointly with Sofia Inspectorate and street sewers with small diameters.
- Up to Ø400 – combined sewer cleaning machines with system for cleaning under pressure, and vacuum system for depleting of sludge – used both in emergency situations for unclogging of street sewers and for proactive works for prevention of street sewers up to Ø400 and prevention against clogging.
- Over Ø400 sewer cleaning automobiles with water recycling – used mostly for proactive works for prevention of street sewers over Ø400 and if unclogging of street sewers is necessary.

At the end of 2013 hydraulic winch with application for mechanical cleaning of sewers as an addition to the activities performed by the sewer cleaning machines. The advantage of the hydraulic winch is that as opposed to cleaning with spray under pressure, through which it is possible removal/clearing of big in terms of pressure, mass and size object from the sewers (tiles, circle-shaped formations from roots, etc.)

Failures on street sewers and sewer service connections due to structural defects –standard technologies are used

- Excavation – replacement of the section where the failure is with internal resource or by means of assigning of a subcontractor;
- Tunnel –with assigning of subcontractor (advantages of the tunnel sites are significant decrease of the inconveniences for the citizens especially in the presence of urban transportation)
- In the next regulatory period purchase is planned of equipment and technology for point insulation of sewers – the technology allows for extending the service life of the equipment without digging but by means of a camera carrier a piece of pipe, shrunk under pressure, is inserted in the facility which on the determined for the insulation point is unfolding and fits tightly to the wall of the facility. In such a way on places with visible fissures a section is reinforced without digging activities.

8.2.3. Using of internal sources

For the activities along the sewerage network mainly internal teams are used which work on issues related to clogging of street sewers, sewer service connections and cleaning of street sewers. Two teams are organized which perform construction activities on building sewer connections, repair activities, repair activities on manholes storm inlets and manholes on street sewers. A team for surveying of the walkable sewers is created. The company has teams for video surveillance of the sewerage network.

The repair activities performed with own resources are the following:

- Installation of covers of manholes, hoisting, decreasing of a level of manholes, plastering on walls and bottom of manholes
- Tracing of existing facilities, locating hidden shafts, constructing of dug holes for confirmation of location of facilities.
- Cleaning of manholes and chambers of overflow facilities from big waste, screen of sag pipes, screens of pumping stations
- Check and repair activities on overflowing facilities
- Survey with surveillance cameras for diameters up to Φ 1200 or by means of physical walking through of big sewers for assessment of the state and planning of prevention activities for prevention of the failures

- Repair activities on sewer service connections and street sewers according to excavation method with depth of the diggings up to 3.5 meters and repair activities of horizontal connections of manholes.

8.2.4. Use of subcontractors

The company assigns the implementation of repair activities on the sewerage of subcontractor only in the cases in which it does not have the necessary technical equipment and/or technology for implementation of the respective repair activity. The subcontractor for the emergency maintenance of the sewerage network is selected by means of public procurement procedure according to PPA.

Repair program Sewerage network

For the period of the Business plan it is envisaged that the tendency in terms of number of repair activities due to structural destruction of sewers, will continue. It is expected a weak increase in the number of repair activities in the category ‘other operational repair activities for sewerage’ and in this category accessory repair activities preventing the occurrence of serious structural destructions in the sewerage network (for example, petit repair activities of sewerage shafts). In relation to the prevention activities along the network a growth rate in the number of prevention activities in 2017 as opposed to the base year and keeping the achieved level for the entire 5-year period.

8.3. WASTEWATER TREATMENT

8.3.1. Organization and planning of the work for sending a signal until removing the repairing the failure – description of the process

The assignment of emergency repair activities in WWTP is performed by the head of WWTP or authorized by the head persons.

For assigned emergency repair activity is considered this type of activity for which assignment letter has been received or a table in e-format Electrical and Mechanical Maintenance – North zone Manager. The assignment of work to the technical employees is performed by means of assigning by the managing units or directly by Electrical and Mechanical Maintenance - North Manager.

After performing the work, a form is filled in for ‘Emergency Maintenance’. Work is accepted by the respective head of unit. After accepting the emergency repair, the assignor reports in the assigning table that the repair activity has been performed.

The activities for maintaining the assets in WWTP are regulated by ‘Regulation for service level’ signed by senior manager WWTP and Senior Manager Electrical and Mechanical Maintenance. The regulation includes the maintenance of all electrical mechanical assets. The planning maintenance of all assets is performed according to an approved schedule.

The performed activities are planned in the following categories:

1. Urgent – directly impacts the treatment process, the data and management of the treatment station, exposes to a risk the work safety, environment. Reaction time – 4 hours.
2. . Important – exposes to a risk without having a direct impact on the process, security and environment. Failure, which is not repaired, will lead to future failure. Reaction time – 12 hours.
3. . Not urgent – does not have an impact and will probably not affect the process, security and environment. Reaction time – depending on the judgement of Electrical and Mechanical Maintenance North Manager.

All activities are described in ‘Regulation for service’ and ‘Procedure for the internal order, rights and obligations of department - Electrical and Mechanical Maintenance’.

8.3.2. Measures and technologies for repairing of failures

The company has a set of high specialized technical equipment for diagnostics of the condition of machines and facilities. It also has highly qualified experts in the area of electrical and mechanical maintenance.

According to a prepared plan schedule preventive activities and maintenance of all electrical and mechanical maintenance are envisaged. The end goal of these activities is decrease of the emergency maintenance. The forecast maintenance and diagnostics is one contemporary approach for asset management in Sofiyska Voda JSC. In its essence it is an early identifying of the reasons and timely inference for their repairing which guarantees the high level of the failure-free work of the machines and the equipment, and the documented history of the monitored parameters leads to extended intervals between the repair activities, decrease of the interruptions due to failures, better planning of spare parts and consumables, increased safety and increase of the organizational efficiency.

The company has the following high technology devices for prevention maintenance and repair activities.

All assets are checked periodically according to schedule for prevention activities:

- Check of the assets by means of infra-red thermography
- Diagnostics of facilities by means of vibro analysis
- Adjustments for coaxial rotor machines through laser coupling
- Locating cable failures and electrostatic discharges of electrical facilities

Files were created of the assets on server of Sofiyska Voda, accessible for all employees having relation to maintenance and management. For the period of the business plan inclusion of new assets is envisaged to the planned maintenance, tracing of all external cable traces supplying facilities for treatment, constant

improvement of the knowledge of the teams working with the special equipment and purchasing of highly technological technical equipment for prevention maintenance.

8.3.3. Using of internal resources

The company has the required engineering technical employees for performance of a major part of the maintenance of the electrical mechanical assets. With internal resources repair activities are performed on the pumping units, hydrophore installation, repair on screens, settling tanks, air blowers, compressors, filter presses, thickeners, electric and instrumentation and automation equipment, etc.

8.3.4. Using of subcontractors

In the process of maintenance of WWTP subcontractors are also used for maintaining of specialized assets for which it is necessary that the repair activities are performed in specialized licensed service buildings.

- maintaining of submergible pumping units
- maintaining gas compressors
- maintaining of hoisting equipment
- Rewinding of electric motors
- Maintaining of process devices
- Maintaining of boilers gas burner

Repair program WWTP

The drying beds in WWTP where temporarily the dewatered sludge is stored which is planned for utilization in the agricultural sector, they present open concrete beds supplied with drainage systems for discharge of the atmosphere waters and residual water from the sludge itself. Each bed is planned to have two drainage channels consisting of a few layers – drainage concrete slabs with openings, 220 in number, which are covered with two different fractions of gravel, the top layers is of sand. The beds are separated from one another with barred concrete walls.

With the passing of time, under the influence of rains and aggressive environment of the sludge, the drainage systems get dirty and clogged, and the concrete slabs and the barring walls are compromised. When the drainage system of one bed does not function, the atmosphere waters are not drained and the sludge increases its humid contents and respectively weight which by multiple times increases the transportation costs and in certain cases it becomes impossible. This is the reason why it is necessary that periodically after a certain number of filling and emptying the beds, it is required to revise the drainage systems on a regular basis

it is envisaged that each year about15 number of beds to be revised and renovation of the following elements to take place:

- Drying beds – drainages15.

- Drainage slabs - 300
- Asphalt surfaces – 200 м^2
- Restoration of barring walls on the beds - about 60 м^2

SV provided additional information as per it. 8.2. in a letter from the EWRC with ref No CB-1677/19.08.2016 regarding the planned expenses in the category regular maintenance in Report No 8 – Repair program on line it. 3.6 “Regular inspection (cleaning,bleeding etc.)”,where the works executed by Electrical and Mechanical Maintenance unit were included.

The jobs performed by the unit for electrical and mechanical maintenance are included in the category of preventive maintenance. Maintenance includes regular check in accordance with a preliminary prepared schedule for the facilities and machines used for the treatment activity, as well as adjustments or other activities aiming to maintain the machines and facilities in good operational order. The number of the executed works concerning preventive maintenance for 2015 is determined on the basis of the internal report forms, in which the specific sites where preventive maintenance was performed and the time for it are specified. The costs for the repairs under item 3.6 include only remuneration costs and social insurance contribution as the amount is determined on the basis of the reported worked time.

9. SYSTEMS FOR THE QUALITY AND INFORMATION PUBLICITY

9.1. IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEM ON БДС EN ISO 9001:2008

Sofiyska Voda has taken the decision to implement a Quality Management System (QMS) in order to have a better control on its processes and provide more quality services to the customers. The process started as a follow-up of the implementation of the new customer information system and aims to certify the customer related processes in the company on the standard ISO 9001:2015.

The new version of the ISO 9001 standard was issued in September 2015 and brings a new approach on leadership, risk management and processes improvement. Although the previous version of the standard is still applicable, Sofiyska Voda has decided to apply the new requirements and become one of the first companies in Bulgaria certified under the new standard.

The system itself is developed based on the quality principles input in the standard ISO 9001:2015:

- Customer focus
- Leadership;
- Engagement of people;
- Process approach;

- Improvement;
- Evidence-based decision making;
- Relationship management.

In the scope of QMS are covered customer related processes: customer accounts management, meter reading, installation, replacement and metrological check of meters, billing, payment management, debt collection and management of interaction with customers.

In the process of development and implementation of Quality Management System on БДС EN ISO 9001:2015 in Sofiyska Voda, in 2016 were prepared, approved and distributed to all employees and other interested parties:

- Policy on quality of service, health and safety and environmental protection, covering all the three management systems in the company - QMS, OHSAS and EMS (on БДС EN ISO 9001:2015, БДС BS OHSAS 18001:2007 and БДС EN ISO 14001:2005);
- Integrated procedures of the three management systems which are in conformity with the three applicable standards in five main areas:
  - Management of documents;
  - Non-conformities management;
  - Evaluation of the conformity with legal and other requirements;
  - Internal audits;
  - Monitoring, measurement, analysis and evaluation of the results of the systems.

9.2. IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT SYSTEM ON БДС EN ISO 14001:2004

Sofiyska Voda was certified since December 2008 on БДС EN ISO 14001:2005 - Environmental Management Systems (EMS). БДС EN ISO 14001:2005 is implemented for the whole organization, for all functional units and activities. Implemented good practices regarding the environmental protection and continuous improvement of EMS were confirmed with periodic audits carried out by a third independent organization and the two re-certifications in 2011 and 2014 (entire review of EMS is done every 3 years - re-certification audit and annually the auditors review the functioning of EMS on a sample basis - the so called *control* audit). In 2017 the company is going to certify its EMS for a third consecutive cycle in line with the requirements of the new version of ISO 14001:2015.

The performance of the policy and the objectives regarding the environmental protection throughout the company is organized by a department specialized in this - Environmental Protection Dept. which maintains the implemented EMS. Responsibilities and roles of the managers and the employees for environmental protection are defined and documented. Implementation and maintenance of EMS

under ISO 14001 ensure continuity of the process for decreasing the risk of adverse impacts on the environment, work effectiveness and efficient use of resources as integrates the principles of the circle economy.

The continuous Policy of the company is to manage the activities which impact on the environment so to preserve the natural environment.

Main long-term engagements which define also the key activities of EMS are:

- Ensuring quality water supply and sewerage services aiming to save the health of the customers and the surrounding environment;
- Conformity and exceeding the applicable legal requirements for environmental protection;
- Prevention, decreasing and control over the negative impacts on the environment as carry out continuous monitoring on the impacts, identifying the potentially significant impacts and evaluation of the impacts on the environment arising from all current and future activities;
- Responsible and economical use of water resources, saving the used energy, fuel and other resources as decrease the wastes generated from the activity;
- Integration of the ecological, economic and social sustainability in the business;
- Improvement the knowledge of employees, customers and suppliers on the concerns regarding the environment and the consequences from the activity for the environment;
- Continuous improvement of the EMS efficiency.

The company has implemented and performs consistent preventive policy for environmental protection with its suppliers and subcontractors. Agreements are signed and applied with the contractors for mutual ensuring and execution of the legal requirements regarding the environmental protection according to the Environmental Protection Act.

9.3. IMPLEMENTATION OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM ON BS OHSAS 18001:2007

Sofiyska Voda was certified since January 2009 under БДС BS OHSAS 18001:2007 - Occupational Health and Safety Management System (OHSMS). БДС BS OHSAS 18001:2007 is implemented for the whole organization, for all functional units and activities. Continuous improvement of OHSMS of Sofiyska Voda was confirmed with periodic audits carried out by a third independent organization and the two re-certifications in 2012 and 2015 (the certificate is confirmed every 3 years with independent external re-certification audits and annual *control* audits). Since the beginning of 2016 the company has been working on the integration of OHSMS with Quality Management System under ISO 9001 and EMS under ISO 14001 and also to ensure conformity with the expected new standard for OHSMS from ISO series (ISO 45001).

Performance of the policy and the objectives regarding H&S throughout the company is organized by a department specialized in this - Health and Safety Dept. which maintains the implemented OHSMS. Responsibilities and roles of the managers and the employees for health and safety are defined and documented. H&S Dept. makes consultations and supports the employer and the other authorized persons in applying the legal requirements and the good practices for ensuring healthy and save work conditions.

Continuous Policy of the company is to ensure as far as realizable the safety and health to all its employees and to other people who might be affected by the company's activities.

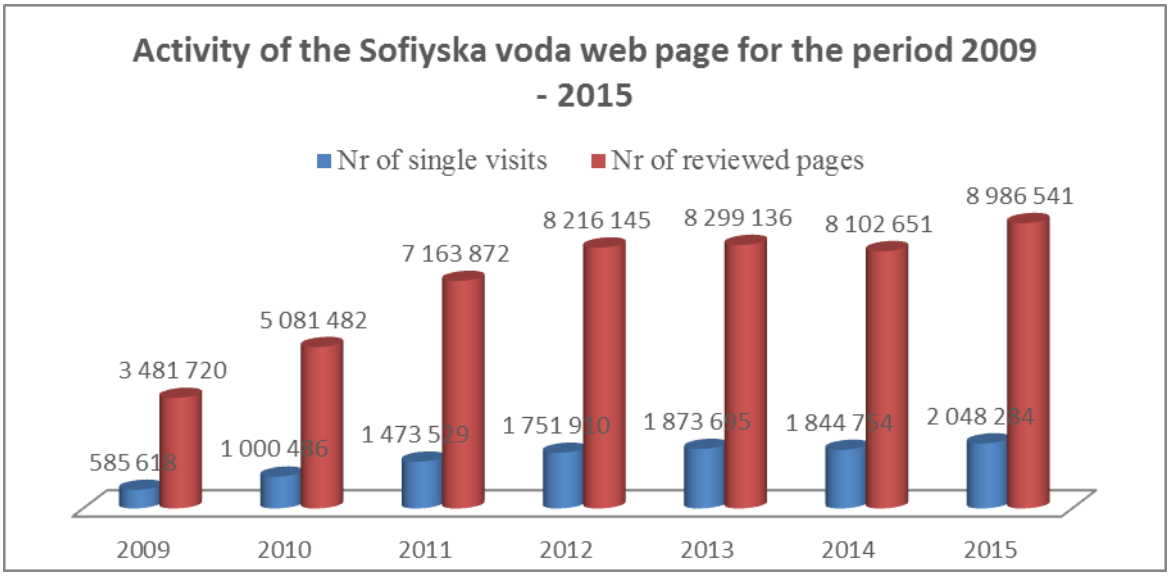
Main long-term engagements which define also the key activities of OHSMS are:

- Management of risk concerning the health and safety of the employees of the company, employees of the contractors and the community;
- Conformity and exceeding the applicable legal requirements for health and safety;
- Prevention the risk aiming to maintain "zero" levels of accidents;
- Registration, analyzing and reporting of all accidents, "near miss" and incidents;
- Trainings, instructions, engagement and motivation of the employees for performance their roles concerning health and safety;
- Continuous improvement of OHSMS efficiency.

The company has implemented and performs consistent preventive policy for ensuring health and safety with its suppliers and subcontractors. Agreements are signed and applied with the contractors for mutual ensuring of health and safety according to the Health and Safety Work Conditions Act. Mutual risk assessments, audits and mutual programs for ensuring health and safety are performed.

9.4. CREATION AND MAINTENANCE OF WEBSITE

The Company website has been created in 2008 and until the end of 2015 it has had the following dynamics in the number of visits:



The website presents a large variety of information about the company`s services and initiatives. It also represents an important communication channel with the customers through the functionalities offered in the customer online account:

- Visualization of issued invoices and their status in terms of payments
- Visualization of the readings, the period for reading and communication of regarding self-reading
- Online communication regarding self-reading
- Subscription for receiving SMS for water interruptions
- Subscription for e-invoice etc.
- Submission of contacts

In the last 2 years, new facilities have been opened for the customers, such as:

- The online geographic information center: provides information about the current works and water interruptions, the investment programs and gives the customers the possibility to submit signals and track their status
- Publication of the water analysis by region, from all points where samples are taken and checked

Nevertheless, in order to provide new services for customers and allow them to visualize information in a user friendly manner and take advantage of the new developments in digital technologies, the company intends to:

- Launch a new website, more customer oriented and benefitting from the advantages of the new web design techniques
- Launch a mobile application allowing customers to access in an easier way the relevant information about their accounts and to perform specific actions: send self-reading, send a contact, signal a failure etc; also this platform will be used by the company in order to send the relevant information to the customers.

More details about the online strategy are presented in it. 5.13 of the document.

III. FINANCIAL PART

1. INVESTMENT PROGRAM

1.1. INVESTMENTS FOR ACHIEVING THE KPIs AND FOR IMPROVING THE ACTIVITIES AND EFFICIENCY OF THE WSS OPERATOR

The investment program developed by SV AD for the regulatory period 2017-2021 complies with:

- the new regulations concerning the regulated WSS services and the instructions thereunder
- the investment commitment to the end of the concession period
- the commitments for additional investments pursuant to Settlement Agreement between MoS and SV AD of 2009 and for the compensation of claims
- long-term financial estimates of the company
- corporate accounting policy

The contents of the investment program have been planned taking into account the following:

- The need of supply of WSS services with sustained high quality to increasing number of citizens of MoS;
- The need for achieving of the agreed upon with the EWRC individual and long-term KPIs for the quality of the activities of the company
- Legal requirements in the area of WSS services, construction, energy efficiency, work safety and environment protection, security of the business;
- The need of constant upgrading of the premises and optimization of the work processes for the purpose of increasing efficiency and providing safe work conditions and security.
- Projections for the development of WSS systems in the Master Plan of Sofia city, Strategy for the development of the technical infrastructure of the MoS, as well as the investment priorities of the Grantor with regard to the sewer network.

Structure of the total investments of the company over the period 2017-2021

	2017 (thousand BGN)	2018 (thousand BGN)	2019 (thousand BGN)	2020 (thousand BGN)	2021 (thousand BGN)
Investments in regulated services	44 163	44 435	38 684	33 779	32 982

Nonregulated investments	1 748	2 712	1 304	1 248	1 196
Additional investments	2 368	1 660	760	1 060	1 060
Total Investments:	**48 279**	**48 807**	**40 748**	**36 087**	**35 238**

The total amount of the funds provided for investment over the period is 209.16 mln. BGN and the average size of the investments per year is 41.83 mln. BGN. For the purpose of a faster achievement of the aimed levels of KPIs and increase of the work efficiency, the company has projected higher investments for the first two years of the period (46.4% of the total investments for the period).

According to the new EWRC directions, investments in regulated services are planned for all water supply systems (WS) together for potable water (WS “Sofia”, WS “Beli Iskar”, WS “Bozhurishte”), as the investments in WS for non-potable water have been presented separately.

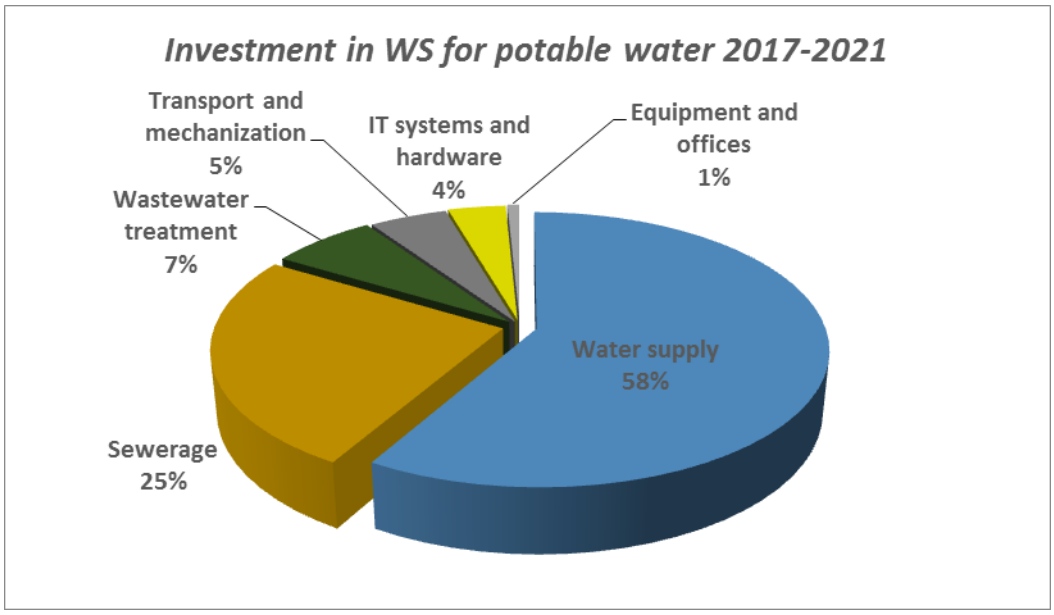
Water Supply systems	2017 г. (thousand BGN)	2018 г. (thousand BGN)	2019 г. (thousand BGN)	2020 г. (thousand BGN)	2021 г. (thousand BGN)
potable water WS	43 463	43 735	38 084	33 139	32 342
non-potable water WS	700	700	600	640	640
Total investments in regulated services	**44 163**	**44 435**	**38 684**	**33 779**	**32 982**

Due to the nature and size of the potable WS, the greatest amount of the investments is directed towards WS “Sofia”. The investments for WS “Beli Iskar” are very limited (under 100 thousand BGN total for the period) and have been envisaged for overhaul of premises servicing the dam and measurement appliances. Of them, in Report 9: “Investment Program”, the share directed towards the supply of water to another WSS operator (19.52% - 17 698) has been separated.

The distribution of regulated investments for WS for potable water according to categories per Report 9 “Investment Program” is displayed in the following table:

Regulated services potable WS	2017 (thousand BGN)	2018 (thousand BGN)	2019 (thousand BGN)	2020 (thousand BGN)	2021 (thousand BGN)
Supply of water to customers	26 228	23 435	20 922	19 562	20 341
Wastewater sewerage	9 771	10 750	10 144	9 221	8 235
Wastewater treatment	3 041	5 024	2 424	1 899	670
Transportation and mechanization	1 728	2 273	1 880	1 591	2 124
Information systems and hardware	1 860	1 909	2 257	504	735
Equipment and offices	835	344	457	362	235
Total:	**43 463**	**43 735**	**38 084**	**33 139**	**32 342**

The following diagram shows the percentage distribution of investment in WS for potable water per categories:



The size of the investment program, as well as the distribution of funds under different categories are based on the expert experience built up to the moment in reference to the value of different civil works, on one hand, and, on the other, are directly connected with the necessary investments for the achievement of certain levels of the KPIs for WSS services and above all the unified KPIs for the regulatory period 2017-2021 the EWRC has determined in the Directions on the application of the Ordinance on the Regulation of the Quality of the WSS Services.

All investments planned by the company represent measures having a direct or indirect impact on the achievement of the target levels of different KPIs. Their relation to exact KPIs has been shown in the next sections to the respective groups of assets.

1.1.1. Investments in own assets

The investments in own assets constitute around 10.5% on an average per year of the company's regulated investments. They are connected with the investments in public assets and have the purpose of aiding the optimal flow of work processes, maintenance of high standards of the services supplied, and increase of the efficiency and the achievement of the individual levels of the KPIs.

The basic groups of own assets in which the company invests are:

- Laboratory equipment for analysis of potable and waste waters
- Transportation vehicles, including construction and specialized machinery;
- IT hardware and information systems and

- Specialized equipment for the activities
- Administrative and servicing buildings
- Inventory

Laboratory equipment for analysis of potable and waste waters

- *Potable water laboratory*

The purchase and replacement of basic lab equipment for analysis of organic contaminants in potable water required under Ordinance 9/16.03.2001 on the quality of potable waters; Ordinance 12 of 2002 on the quality requirements to surface waters intended for drinking and household water supply; Ordinance No. 1 of 2007 for research, use and protection of subterraneous waters. For the purpose of cutting the analysis time in the control of microbiological indicators monitored in the potable waters, during that period the purchase of an analyzer has been envisaged for real-time determining of microbiological indicators. This will lead to a faster and timely assessment of the efficiency of disinfection of the potable water. The investments envisaged for the purchase of new appliances and replacement of existing equipment in the laboratory for potable water will allow a constant reliable and full control over the KPIs of the potable water, which is a main factor in keeping the KPI2 level. (Please refer also to Section II 2.5 Program on improvement of the quality of potable water).

- *Wastewater laboratory*

Over the period 2017-2019 the purchase and replacement of basic laboratory equipment for analysis of organic contaminants, ionic forms and elements in the wastewaters and sludge, required under Ordinance № 6/09.11.2000 on the emission rates of the allowed contents of poisonous and harmful elements in the wastewater, discharged in water bodies and Ordinance 7/14.11.2000 for the conditions and the order for discharge of industrial wastewater in the sewerage systems of settlements and the Ordinance on the procedure and way of utilization of sludge from wastewater treatment by their use in agriculture dated 2004. It will ensure the continuous control of key pollutants in wastewater and sludge. The systematic control of the indicators of wastewater is a major factor for maintenance of high level of compliance with the KPIs for raw and treated wastewater (KPI8)

For the two laboratories the replacement of the depreciated instrument equipment and small and auxiliary lab equipment participating in the analyses of the potable, surface, subterranean and wastewaters, and sludge from the WWTP has been envisaged. The auxiliary equipment includes laboratory thermostats, drier furnaces, sample takers, refrigerators, distillers etc., with which the necessary conditions for the analyses are provided and the requirements specified in the methods used are met. On the other hand, the auxiliary equipment will ensure a safe work environment in the lab and safe storage of the used reagents and chemicals used for the analyses.

Transportation vehicles, including construction and specialized machinery:
The greatest share of investments in own assets in the regulatory period (9.6 mln. BGN) has been envisaged for the purchase of transportation vehicles, construction and specialized machinery (hereinafter referred to as road vehicles – RVs).

"SV" AD owns 341 RVs with original registration in the period 1984 – 2015 and average age 8 years. The road vehicle park consists of: special vehicles – *sewer cleaning machines, container carriers, water tank, auto crane*; road construction vehicles /RCVs/ - *excavators, mini excavators, front loaders*; heavy load vehicles with a total weight over 3.5 tons – *dump trucks, freight wagons*; light vehicles with a total weight to 3.5 tons - *two-seater automobiles with a freight section, freight wagons, pickups;* passenger vehicles – *4x2, 4x4 transmissions, mini busses*; trailers and tractors.

The majority of the RVs from the auto park of SV are used only on the territory covered by the concession. The operation manner – travel in urban conditions, often halts and starts, visits of places of failure and of interrupted or lacking road surface, carrying of different materials and equipment depending on the purpose of the visit, operation in emergency failure regime – is a prerequisite for an intensified depreciation of the vehicles. The funds envisaged are fully for the replacement of existing RVs, which is done according to the following criteria:

- *Cost Efficiency*

  Each year an analysis of the state of the auto park is made, as the results from the previous year are used, changes according to past years are accounted for and a selection of risk vehicles is drawn up. A subsequent analysis is made of the resource from the selection as to the reasons that lead to the increased expenses by using an established financial model in the company. In case the expenses on the maintenance and operation of the existing resource exceed the acquisition, maintenance and operation of a new resource costs, a proposal is made for replacement. The decision is taken depending on the funds approved in the Business plan and the Budget for the year, taking into account the SV priorities.

- *Safety*

  It is applied for vehicles, which are dangerous for further operation – a strongly corroded compartment or chassis, whose recovery is not cost-worthy or is impossible; defects, cracks, destruction of the original construction or material fatigue of basic elements of the used RV.

- *Decommissioning of RV*

  It is applied in case of total damage as a result of a road accident; property destruction, theft, if it is stopped as a result of an annual technical check, serious damage, whose recovery is economically inefficient or is impossible.

The greatest share (73%) of the funds for RVs in the next regulatory period is planned for the purchase of construction and specialized machinery and heavy load vehicles. 24% of the funds will be invested into the purchase of light vehicles, which are most widely used for the operative work of the company.
During the period 2017-2021 the purchase is envisioned of a new mobile system for trenchless rehabilitation of sewers and replacement of:

- 6 special sewer cleaning machines, produced in 1995, 1996, 1998 and 2002;
- 10 combined excavators - loaders, produced in 2005 and 2008;
- Head loader
- 4 dumpers, produced in 1994;
- 1 truck with a crane, produced in 1990;
- Loading wagons, produced in 2009;
- 4 electric and motor trucks;
- 2 snowmobiles, produced in 2005;
- Light commercial vehicles, produced in 2003, 2005, 2008, 2010, 2011 and 2013

In connection with it. 8.4. of the Minutes from the public discussion dated 11.11.2016 signed between SV and the EWRC we provide the following additional information in connection with the planned investments in sewer cleaning vehicles:
For the period 2017-2021 SV plan gradual replacement of 6 sewer cleaning vehicles as follows:

- In 2017 the Company will replace two combined sewer cleaning machines Canalmaster, with chassis Mercedes Actros with 1 new combined sewer cleaning machine with used water recycling. The machines planned for replacement were produced in 2002 and are with placing volume of the tank of 8 m3. They are intended mainly for emergency activities on the network: blow-through of sewers, sewer service connections, storm water drains and manholes, and for the removal of the resulting from the blowing middling slime, but they are also used for preventive work on the existing network. The machine which is to replace them will have placing volume of the tank of 10m3 – 12m3 and will be used mainly for proactive activity – preventive works on the network and cleaning of trunk sewers with a diameter exceeding 1000 mm. The use of machines with water recycling leads to decrease in the used water volumes for process needs, much higher efficiency of the machine in terms of the volume of the dirt removed from the sewer only by one visit and overall decrease in the operating costs for preventive maintenance per unit length of sewer. The bigger placing volume of the tank and the use of recycled water from the sewer decrease the number of the technological trips for sludge transportation from the place of the preventive maintenance works to the place

of disposal. The higher power of the pump for high pressure and the increased flow rate of the vacuum pump expand the scope of the possible diameters of sewers subject to network preventive maintenance.

- In 2018 similar to the replacement in 2017 will be replaced another two combined sewer cleaning vehicles Canalmaster with chassis Mercedes Actros by one new combined sewer cleaning vehicle with recycling of the consumed water. The machines planned for replacement are manufactured in 2002 and are with placing volume of the tank 8m3. The machine that will replace them will have placing volume of the tank 10-12 m3 and will be used mainly for preventative maintenance – preventative inspection of the network and cleaning of trunk sewers with diameter exceeding 1000 mm
  The replacement in 2017/2018 of the existing combined sewer cleaning vehicles by new combined sewer cleaning vehicles with recycling of the consumed water is determined by the change in the focus of the work in Sewerage Services Dept. – from emergency works to proactive activity and extension of the possible diameters of the sewers for regular inspection of the network /sewers with diameter exceeding 1000 mm/
- In 2020 one sewer cleaning vehicle Muller with Mercedes chassis, manufactured in 1996 and used for emergency activity will be replaced by a new sewer cleaning vehicle with the same purpose. A new compact combined sewer cleaning machine will be purchased with recycling of the consumed water designated for regular inspection of the sewers in the central part of the city.
- In 2021 one sewer cleaning machine Muller with Iveco chassis manufactured in 1998 and designated for pumping out sewage and sludge from sewers and septic pits will be replaced by a new combined sewer cleaning vehicle with recycling of the used water. One of the sewer cleaning vehicle Woma with ŠKODA chasses manufactured in 1995 designated for emergency activity will be replaced by a new sewer cleaning vehicles with the same purpose
  The funds for buying sewer vehicles are planned on the basis of preliminary market survey.

All six sewer cleaning vehicles planned to be replaced in the regulatory period are fully depreciated and with zero residual value as at 2015.
Four of the vehicles have been used since 2002, one - since 1998 and one - since 1996.
The six vehicles are in a quite bad operational condition, with low efficiency in terms of the technical performance of the special jobs related to cleaning/preventive works on the sewer network, unclogging of sewers, etc.
All six vehicles have high fuel consumption, which is due both to the level of wear out and the lack of recycling options, which requires driving of further distances in view of emptying the wastewater and sludge.

There are frequent breakdowns due to the mechanical wearing and corrosion of the entire construction and the special machine components.

At the same time, in 2015, a little above 73% of all activities for the maintenance of the sewer network were completed with the use of the special equipment. The same trend has been kept in 2016 as well. This requires reliable, efficient and safe vehicles, which will allow in long-term plan both the timely and quality service of customers' signals and the performance of the planned proactive activities.

The replacement of the six sewer cleaning vehicles in a long-term plan is related to the achievement of the levels of the KPI 9 Failures on the sewer network and KPI 10 Flooding in properties of third persons caused by the sewerage, as far as the preventive works and the maintenance of the sewer network is expected to decrease the level of frequency of breakdowns and the flooding of properties due to reasons other than the structural damages to the sewerage facilities.

Below is given the comparison of the efficiency of the vehicles planned to be replaced (time for operation of the pump) with the same parameters of a machine with superstructure for wastewater recycling (used since 2008) and a new machine:

Parameter	Vehicles to be replaced	Special machine with superstructure, used since 2008	New sewer cleaning machine with superstructure - forecast
Time for operation of the pump versus the total time of functioning of the machine (*)	Max. 30 %	55 % - 65 %	70 %
Recommended min. % ratio of the operation of the pump and the total duration of the operation of the vehicle	35 %	55 %	55 %

(*) The total time for operation of the machine includes the time for transport (passed distance between the points of work, the place for discharge of the wastewaters and sludge and the place for overtime/down time of the vehicles) and the time for operation of the pump – down time of the machine with the engine running (taking the wastewater, sludge and cleaning under pressure).

As it can be seen for the comparative table, the efficiency in 2015 of the sewer cleaning vehicles, planned to be replaced, decreased to a level which is below the one recommended for the respective type of vehicles. This means in practice that the respective machine is used more than it is recommended for the performance of a given job and its efficiency is insufficient. Therefore, at preset the use of these vehicles is avoided for the performance of preventive works on the sewer network.

The expectations are that as at the end of the regulatory period, due to the replacement of the six sewer cleaning vehicles, it will be possible to increase

the length of the network with performed preventive works by 20 km more as compared to 2015.

Year	2015	2017	2018	2019	2020	2021
Preventive works, km of network	<140	145	150	150	155	160

It is planned when buying the new sewer cleaning machines to set a fixed price for the maintenance and repair under the annual subscription principle, with which decrease is expected in the costs for maintenance with increased efficiency of the vehicles (more planned hours of operation). This is the reason for setting the same costs for maintenance and repair of the new sewer cleaning machines. The expectations are for 25% decrease in the average fuel consumption at the same passed distance and functioning of the superstructure for the new vehicles as compared to the old ones which are to be replaced (according to date from the manufacturer). The replacement of the special vehicles will be done within the first six months of the respective year. The savings are calculated on the basis of the difference between the costs which will be incurred with the present vehicles and the expected costs when the project is implemented for their replacement.

The replacement of the sewer cleaning vehicles with new ones in the period 2017-2021 will have the following impact on the operating costs for repair and fuel:

Sewer cleaning vehicles	Costs, BGN	2015 – base year, BGN	2017	2018	2019	2020	2021	Total for the period of the BP 2017-2021, BGN	Savings for the regulatory period, BGN
Old vehicle Mercedes Actros (1)	*Costs for fuel*	27127	13564				0	13564	196901
	Costs for repair and maintenance	17096	8548				0	8548	
Old vehicle Mercedes Actros (2)	*Costs for fuel*	27127	13564	0	0	0	0	13564	
	Costs for repair and maintenance	17096	8548	0	0	0	0	8548	
New sewer cleaning vehicle (2017)	*Forecast costs for fuel*	0	20345	40690	40690	40690	40690	183105	
	Forecast costs for repair and maintenance	0	2000	4000	4000	4000	4000	18000	
Old vehicle Mercedes Actros (3)	*Costs for fuel*	27127	27127	13564	0	0	0	40691	153145
	Costs for	17096	17096	8548	0	0	0	25644	

	repair and maintenance								
Old vehicle Mercedes Actros (4)	*Costs for fuel*	27127	27127	13564	0	0	0	40691	
	Costs for repair and maintenance	17096	17096	8548	0	0	0	25644	
New sewer cleaning vehicle (2018)	*forecast costs for fuel*	0	0	20345	40690	40690	40690	142415	
	Forecast costs for repair and maintenance	0	0	2000	4000	4000	4000	14000	
Old vehicle Muller (5)	*Costs for fuel*	27127	27127	27127	27127	13564	0	94945	-701
	Costs for repair and maintenance	17096	17096	17096	17096	8548	0	59836	
New sewer cleaning vehicle (2020)	*Forecast costs for fuel*	0	0	0	0	20345	40690	61035	
	Forecast costs for repair and maintenance	0	0	0	0	2000	4000	6000	
Old vehicle Muller (6)	*Costs for fuel*	27127	27127	27127	27127	27127	13564	122072	-234
	Costs for repair and maintenance	17096	7096	7096	7096	7096	8548	76932	
New sewer cleaning vehicle (2021)	*Forecast costs for fuel*	0	0	0	0	0	20345	20345	
	Forecast costs for repair	0	0	0	0	0	2000	2000	
								Total for the period 2017-2021	**349111**

The distribution of investment funds on the types of cars is shown in the following table:

Cars, construction and special machinery	2017 BGN	2018 BGN	2019 BGN	2020 BGN	2021 BGN	Total BGN
Light commercial vehicles for water supply	211 868	427 553	747 264	300 022	271 038	**1 957 746**
Light commercial vehicles for sewerage	18 133	19 087	73 486	0	0	**110 706**
Light commercial vehicles for WWTP	36 266	0	0	0	0	**36 266**
Light commercial vehicles	95 436	0	0	88 402	0	**183 838**
Total light commercial vehicles	361 702	446 640	820 750	388 425	271 038	**2 288 555**

Trucks for water supply	120 523	0	0	0	0	**120 523**
Trucks for WWTP	114 523	0	0	0	229 046	**343 570**
Total trucks	235 046	0	0	0	229 046	**464 093**
Construction and special machinery for water supply	34 166	66 805	820 750	114 523	343 570	**1 379 814**
Construction and special machinery for sewerage	1 049 796	1 622 412	0	906 642	1 097 514	**4 676 364**
Construction and special machinery for WWTP	47 718	0	238 590	181 328	0	**467 636**
Total Construction and special machinery	1 131 680	1 689 217	1 059 340	1 202 494	1 441 084	**6 523 814**
Cars for water supply	0	0	0	0	22 905	**22 905**
Cars for sewerage	0	22 905	0	0	0	**22 905**
Cars for WWTP	0	22 905	0	0	0	**22 905**
Cars	0	91 619	0	0	160 332	**251 951**
Total cars	0	137 428	0	0	183 237	**320 665**

The resources planned for the purchasing of passenger cars are barely 3% of the total investments in RVs, as with them a mini bus will be purchased, equipped as a mobile customer service center and an off-road automobile produced in 1994 will be replaced. 14 passenger cards, used by managers of the company and produced in 2009 are also planned for replacement.

The distribution of investment funds according to types of vehicles has been shown in the following table.

Transportation vehicles and especially construction and specialized machinery have a direct impact on the achievement of the KPIs in the sphere of activity they are used in. The impact of the respective construction or specialized machinery is most direct on the indicators of continuity of water supply (KPI3), total water loss in WS (KPI4), sewer system failures (KPI9), flooding of properties of third persons because of the sewerage (KPI10), as well as the utilization of sludge by the WWTP (KPI11c).

IT hardware and information systems

The information systems and hardware are used in nearly all work processes in the company and in this sense they are an essential auxiliary factor for achievement of

the majority of KPIs. Funds have been envisaged for replacement and upgrading of existing IT equipment due to expired operational life:

- Present server machines used in the specialized center for information gathering and processing “Daticum”
- The provision of a different class of computers and laptops (computers and monitors) for business need. The necessity for replacement of around 100 computers and mobile systems on an average per year emerges – for faulty, outdated and depreciated devices. In 2013 200 personal computers were bought, which to the end of the regulatory period will be depreciated and will have to be replaced. Due to this reason a gradual increase of the funding for computers has been envisaged.
- Replacement or upgrading of the existent net equipment due to expired or expiring in the period 2017-2021 operation period. In the distant locations communication devices have been installed providing the connection of the same to the central office and the IT systems servicing the main business processes in the company. These devices are no longer produced and maintained by the producer it is necessary to be replaced one by one to avoid crash in communications in case any of them gives defects. The implementation of a system for management of events and incidents along the network has been planned (SIEM).

For 2018 the accomplishment of a project on the implementation of IP calls is planned. The currently working fixed phone decision is based on technologies from mid XX century. The central, servicing all fixed calls of SV AD was bought in 2006 and is in constant exploitation. During the last years problems emerged in relation to shortage of resources. The central reboots itself randomly, which cuts the calls it a certain time is needed to recover its functionality. The centrals working using this technology become difficult to purchase and have a higher price compared to those working with modern technologies (VoIP). In addition, the system recording all calls of employees in the departments “Debts Collection” and “Internal Audit” does not provide the necessary functionality. With the implementation of a new system for calls working under a modern technology for voice transfer a higher reliability and security will be achieved, more functionalities will be available and a recording system, an easier integration with other voice transfer decisions will be possible (for ex. Call center).

The company has planned the necessary investment funding for providing software licenses depending on the needs of the work processes and the operative tasks of the employees, including the need for additional licenses and maintenance connected to the operative activities of the company.

Funds have been envisaged for modernizing the company **website**. It was developed before 2008 and since then it has not been updated. Much functionality has been added. The platform it was built on is outdated and is not maintained by the producer. This, other than it diminishes its functionality, has a risk from the point of

view of security. That is why a decision was taken for its modernization by implementing all necessary technologies for providing the needed functionality and ensuring security of the site.

Information on investments in information systems is presented in section 1.1.3 “Investments into systems and data bases”.

Specialized business equipment

- *Other specialized water supply equipment*

➢ Equipment for active leak control

In order to continue to maintain the good rate of decrease of total loss in the system (KPI4), the company has planned funds for the purchase of additional and replacement of existing equipment for survey of the network and hidden leaks detection – correlators, tracing device, equipment for the localization of failures etc. As a consequence of the test carried out in 2015 of equipment for survey of water mains and acoustic diagnostics of leaks from them, the company plans in 2018 to purchase a similar equipment, which will allow visual inspection of the condition of the strategic water mains and key water mains from the distribution network, together with detailed diagnostics and detection of possible leaks on the same. In 2016 the company started a test project for the placement of stationary acoustic loggers on the system, which will allow the possibility for constant monitoring of the network and signaling in case of failure. The company plans for the project on the placement of stationary acoustic loggers to be long-term, as after 2019 significant investments are envisaged to be provided for equipment of the network and the provision of constant monitoring of the same.

Investments in modern equipment will be reflected in improvement of the active leaks control indicator (KPI11e), as well as in the total system losses (KPI4), as the detection of leaks is the basic instrument for keeping the trends in decreasing the real losses on the network.

In reply to the letter from the EWRC ref.CB-1677/19.08.2016 under item 9.3 the Company provided additional information about the planned resources for buying the following types of equipment:

Planned projects	2017 (k BGN)	2018 (k BGN)	2019 (k BGN)	2020. (k BGN)	2021 (k BGN)	Total (k BGN):
Equipment for active control of leaks	195	286	193	153	143	**970**
Camera for survey of water	0	95	0	0	0	**95**
Equipment of Department “Failures and maintenance of the water supply network”		93	148	122	146	**752**

Station GK 403 – measuring vertical field displacement	10	0	0	0	0	**10**
Turbidity meter for water catchments	0	95	0	0	0	**95**
Total:	**447**	**570**	**341**	**275**	**290**	**1 922**

As it has been stated in Section III.1.1.1 Investments in own assets, for equipment for active leakage control, the company envisages to purchase correlators, tracing equipment for survey of pressure water mains and acoustic diagnostics of the leaks on them, acoustic loggers, etc. Similar information has been provided under item 2.11. Program for active leak control and under item 6.3.2. Database for the control flowmeters and data loggers. In addition, the existing equipment for hidden leaks detection will be replaced step-by-step from 2017, in conformity with the expiry of the depreciation periods of the individual types of equipment. The investments in the modern equipment will be reflected in the improvement of the indicator for active leak control (KPI 11e), and on the total losses in the system (KPI 4). The costing is based on the preliminary studies for the prices of the respective equipment.

The equipment for the *In-house Failures and Maintenance Dept*. includes: butt-welding machines 250mm and 630mm, pressurized machine for drilling and welding couplers, rammers, breakers, trash pumps, compressor "mole", generators, hydraulic station systems for strengthening and fences for pits, etc. In terms of the specific investment costs for equipment of the *In-house Failures and Maintenance* Team, the company has precise estimates by years, type and number, based on the prices under which such equipment is currently available. Based on the experience of the company, funds are also provided for overhaul of equipment and machines for trenchless laying of pipes.

The planned purchase and installation of turbidity meters is related to the intention for establishment of a system for monitoring the turbidity of the raw water from the river catchments. The installation of turbidity meters at the points of water abstraction and ensuring the connection with the SCADA system will allow real-time control in terms of the dynamically changing characteristics of the river catchments. The information from the measurements will be used for early warning and taking measures for disconnection of the respective water abstraction sites in case of sharp increase in the water turbidity as well as for optimization of the adjustment of the disinfection process depending on the fluctuations of the levels of the indicator. The implementation of this specific project is not only related to the security of the water catchments in view of the increasing risk of terrorist attacks but it will contribute to the maintenance of the levels of KPI 2a and KPI 2c as well.

- Measuring devices – turbid water meters for the water catchments (KPI2), stations GK403 for measuring vertical displacements for the “Beli Iskar” dam and equipment chamber “Passarel”.

- *Other specialized sewer equipment*

Investments have been planned for the replacement and purchase of new video cameras for survey of sewers and sewer collectors. The method has proven its usefulness and its application is becoming broader in the preparation of programs for regular checkup, maintenance and reconstruction of parts of the existing sewerage network. There is a direct link with the achievement of the target levels of the KPIs for failures and flooding in properties of third persons caused by the sewer system (KPI9 and KPI10).
Under item 9.5 of the same letter from the EWRC the Company sent the following detailed information for “Construction and special vehicles for sewerage“ from Report 9 – Investment program:

Planned projects	2017 (k BGN)	2018 (k BGN)	2019 (k BGN)	2020. (k BGN)	2021 (k BGN)	Total (k BGN):
Technological equipment for trenchless rehabilitation of sewers	0	573	0	0	0	573
New sewer cleaning machines	1 050	1 050	0	907	1 098	4 104
Total:	1 050	1 622	0	907	1 098	4 676

The supply of technological equipment is planned in 2018 for trenchless repair and rehabilitation of the sewerage through installation of a sealing system in the zone of the occurred damage of the intactness of the sewer in a fully mechanical way through installation of steel bush (sleeve) with EPDM sealing. For the repairs in many damaged pipes, a number of bushes can be installed in series, as the connection between them is made through a special buttoning with elastic hinges.

- *Other specialized equipment for wastewater treatment*

The funds are envisaged for replacement of pumping aggregates, stop valves, Instrumentation and Automation equipment, process equipment for the aeration tanks and devices for measuring the COD, SS, total nitrogen and total phosphorus at the inlet of the aeration tanks in WWTP Kubratovo. The equipment will contribute to the normal flow and optimization of the wastewater treatment processes and for the achievement of the KPIs on the wastewater treatment activity (KPI11b) and quality of the treated wastewaters (KPI8).

<u>Administrative and servicing buildings</u>

The investment intentions of the company are for it to build garages for the specialized sewer-cleaning machines in the “Batalova Vodenitsa” base and a

new base for the teams of “Failures and Water Supply Network Maintenance” department in the Iskar Station region, which will allow a more efficient work of the teams covering a bigger territory of the MoS. Funds have also been envisaged for major overhaul of buildings in the “Batalova Vodenits” base and of offices of the CSCs.

Inventory

The planned funds for the purchase of props for trenches, road warning signs, and small mechanics for the internal construction groups; video surveillance cameras and alarm systems, occupational safety equipment, equipment for maintenance of grass fields at the properties, with which the company operates, systems for the management of visitors in the CSCs, office furniture etc.

In the additional reply to the Regulator with regard to the letter ref.CB-1677/28.07.2016 Sofiyska Voda provided a justification for the planned resources for buying furniture, fixtures and fittings and it was specified that annually dozens of chairs and cameras should be bought at the average value of BGN 100-150, but also single vans and guard booths should be bought for the needs of the security at the amount of 7-8 k BGN. The need of buying furniture, fixtures and fittings sometimes arises dynamically and it cannot be planned in number. Some of the assets, for example security alarm systems, are subject to design and cannot be “counted”. Due to the enumerated reasons Sofiyska Voda believes that in the group “furniture, fixtures and fittings“ the number is not indicative for the contents of the investments. The planning of the Company investments for this group as well was done in detail as maximum as possible and related to the planned development of the activity.

1.1.2. Investments in public assets

Public assets are basic resources for the business of SV AD and respectively for the achievement of the target levels of the KPIs. This defines the focus of the investment resource of the company exactly in this category of assets – over 86% of the total volume of regulated investments.

More precisely the investment pans of the company in public assets connected to the provision of regulated services and their link with the achievement of the target levels of the KPIs are presented according to asset groups.

INVESTMENT IN PUBLIC ASSETS FOR WATER SUPPLY

- *Dams*

Investments for the “Beli Iskar” dam are very limited (under 100 thousand BGN total for the period) and are envisaged for major overhaul of buildings servicing the dams and measurement devices. They will contribute to the security of the servicing of the dam and indirectly to the maintenance of the full coverage with water supply services (KPI1) and continuity of water supply (KPI3).
Due to the differences in the opinions of the institutions and the position of the EWRC, in Business Plan 2017-2021 the company has not provided for investment measures for the rehabilitation of the dam wall (refer to section 1.2.1).

- *River catchments and catchment points*

The planned investments are for the reconstruction of water catchment “Cherni Iskar” according to a work schedule and equity maintenance of the remaining catchments, as well as supply and installation of turbidity measurement devices. These measures will contribute to the maintenance of the levels of KPI1, KPI2a and KPI2c, KPI3.

- *Sanitary Security Zones*

Funds are envisaged for the construction or reconstruction of the fences of the sanitary security zones of water sources and reservoirs, with which other than aiding the meeting the KPI levels for potable water (KPI2) and continuity of water supply (KPI3), to achieve compliance with the legal requirements and security of water sources.

- *Impounding structures*

Financial resources are planned for the replacement of parts of existing water mains and trenchless rehabilitation of other. For “Iskar” water main and the impounding water mains to “Lozenets” reservoir a renovation is planned using cathodic protection. These investments will contribute to the achievement of the key performance indicator “rehabilitation of the water supply network” (KPI11d), decrease of the total water losses (KPI4) and restricting the failures of the system (KPI5), as well as KPI1, KPI2, KPI3.
For the period the replacement of 13 stop valves (SV) with ø800 is envisaged for the impounding mains, an major overhaul of a Johnson’s floodgate for the “Passarel” main and replacement and installation of over 50 SVs of release valves and air release valves with ø200. Funds have been planned for the construction and rehabilitation of shafts, floodgates etc. Thus the security of the system will be enhanced and its management improved, which has a direct influence on the continuity of water supply (KPI3). Information in reference to the investments in impounding mains and structures is presented in section VI.6.1.

The construction of the facilities for connection of the village of Vladaya to the water supply system of Sofia city will be finished, as in 2017 the construction of the rising main from the new Vladaya TP to the existing reservoir in the village is envisaged. Thus compliance will be achieved with the legal regulations in reference to the surface water sources and the levels of the KPIs for continuity of the water supply (KPI3) will be positively influenced.

- *Potable water treatment plants*

The significant investments provided for are for modernization and optimization of the work of the facilities and for step-by-step rehabilitation of the numerous building facilities. They will contribute above all towards maintaining the level of the KPIs for quality of the water (KPI2) and continuity of the water supply (KPI3), but also towards increase of the energy efficiency (KPI11a), the achievement of compliance with the legal requirements for seismic stability of the buildings and fulfilment of the commitments of the company as to the state of the assets during their returning. The rehabilitation of the clarifiers in the PWTP Pancharevo and of the water main for own purposes and the water supply network in PWTP Bistritsa will exert a positive influence on decreasing the total water loss (KPI4). At the end of the period the construction of a UV installation has been planned for potable water treatment at the outlet of PWTP Bistritsa, which other than improving additionally the quality of water, will allow decrease of the stored quantity of chlorine gas in the station and will thus increase its security. Investments in PWTP have also been described in section II. 2.5. *Potable water quality improvement program.*

With regard to item 9.1. of the letter from the EWRC ref.CB-1677/19.08.2016 the Company provided additional information for the data on line Potable water treatment plants in Report 9 Investments, as follows:

	Data from report 9	2017 (k BGN)	2018 (k BGN)	2019 (k BGN)	2020. (k BGN)	2021 (k BGN)	Total (k BGN):
	Potable water treatment plants	**4 158**	**1 879**	**1 056**	**1 325**	**2 460**	**10 879**
1	Rehabilitation of the building of the filter house in PWTP Bistritsa	1 621	0	0	0	0	**1 621**
2	Rehabilitation of buildings in PWTP Bistritsa	204	382	134	0	345	**1 064**
3	Gradual rehabilitation of filter cells in PWTP Bistritsa	310	310	310	310	310	**1 551**
4	Reconstruction of the stilling basin	0	0	29	62	232	**323**

	of the inflow constriction at PWTP Bistritsa						
5	Rehabilitation of sewers for process water in the filter house at level -0.90	0	0	0	137	0	**137**
6	Rehabilitation of water main for own consumption and site water supply networks	0	0	198	197	0	**394**
7	Reconstruction of the sand field at PWTP Bistritsa	156	0	0	0	0	**156**
8	System for UV disinfection at the outlet of PWTP Bistritsa	0	0	0	95	1204	**1 300**
9	Contraction of a new switchboard in PWTP Bistritsa	76	0	0	0	0	**76**
10	Rehabilitation and modernization of buildings and facilities in PWTP Pancharevo	1538	789	48	75	0	**2 450**
11	Gradual rehabilitation of filter cells at PWTP Pancharevo	0	239	239	239	239	**954**
12	Total capital maintenance at a PWTP	253	160	100	210	130	**852**
	Total:	**4 158**	**1 879**	**1 056**	**1 325**	**2 460**	**10 879**

1. Rehabilitation of the building of the filter house of PWTP Bistritsa

The work on the rehabilitation of the building of the filter house in PWTP Bistritsa commenced in 2013 when the roof was partially repaired (5 decares), which has a total area of around 10 decares. In 2016 the works related to the rood will continue. The accomplishment of the whole project will continue in 2017, when the following basic activities are envisaged:

- Overhaul, including thermal insulation of the roof - completion
- Structural reinforcement of the building
- Thermal insulation of the external walls and a new window-pane system
- Construction of water- absorption system of the building (the open water area in the filter house is around 4900 sq. m)
- Replacement of the rails around the filters and the stairs (total length 945 m)

Rehabilitation of the roof and the structural reinforcement of the building is implemented following an approved detailed design. The costing was made on the basis of a bill of quantities for the project, under prices for analogous activities of other agreements of the company. For the remaining works Sofiyska Voda team works on the preparation of terms of reference for the design and the costing was made according to approximate quantities based on actual sizes and again the prices for analogous works have been used from other contracts or market researches.

All envisaged measures comply with the current statutory requirements for energy efficiency, seismic stability and occupational health and safety. They aim at making the building complaint therewith. Changes to the electrical power consumption in connection with the envisaged construction of a water- absorbing system have been presented in it. 4.1.1 “Cost for materials” and it. 4.1.5 “Projected future costs…” of the company’s business plan. It is expected after the construction of this system a reduction of the corrosion of metal constructions to be achieved in the filter house, with which the period of their operation to be prolonged.

2. Rehabilitation of buildings in PWTP Bistritsa

The buildings of the operation chamber, the lime line, reagent house, boiler house, power substation, warehouses and garages have been planned for overhaul. The efforts will be directed above all to the rehabilitation of roofs and windows. The purpose of the project is to ensure the legally-required characteristics of working environment in the premises, as well as appropriate conditions for material and reagent storage and avoidance of impairment of their qualities during their storage (for ex. as a result of storm water penetration through roof leakage, through rotten window frames, crevices on the walls etc.).

The costing has been made according to approximate quantities based on the actual sizes of the buildings, as prices for analogous works have been used.

3. Gradual rehabilitation of filter cells in PWTP Bistritsa

The rehabilitation of 10 filter cells in PWTP Bistritsa, including the drainage systems, has been planned. The implementation of the project will allow achieving a more efficient filtration of potable water, reduction of the quantity of formed process water and reduction of the total consumption of electrical power for treatment owing to the reduction in the frequency of flushing.

The costing was made on the basis of preliminary researches of the prices for similar facilities and company contracts.

4. Reconstruction of the stilling basin of the inlet facility of PWTP Bistritsa

The inlet facility of PWTP Bistritsa has four trunk channels, which flow out in one common stilling basin. The current construction does not allow flexibility during repairs or preventive maintenance of the stilling basin and requires termination of the work in the entire treatment plant. Due to the lack of an alternative for a big number of company customers, the above-stated repair activities are carried out under hard conditions and time restrictions. The envisaged project aims at having two mutually replaceable stilling chambers, which can work completely independently This will allow reliability and flexibility at the same time with regards to the management of water flows during repair or preventive maintenance activities, which are an inevitable part of the operation of the treatment facilities. The costing was made based on prices for similar civil works.

5. Rehabilitation of the channels for backwash in the filter house, elevation -0.90

The project aims at increasing the reliability of the channels for backwash and it will have a positive impact for decreasing the infiltration on the territory of the PWTP Bistritsa. The costing was made on the basis of the prices for similar civil works.

6. Rehabilitation of the water main for own needs and internal site water network

The water network of PWTP Bistritsa is supplied with water from a reservoir for own needs through a PS for own needs. The network consists mainly of poor quality steel water mains constructed in the ‘90’s, which are obsolete and there are frequent failures on them. The replacement of about 1300 m of water mains is planned. The costing for it was made on the basis of the prices under which the company performs similar civil works.

The rehabilitation of the water main for own needs and the internal site water network in the PWTP Bistritsa will result in decrease in the number of failures and will have a positive impact on the total water losses reduction (KPI 4).

7. UV disinfection system at the outlet of PWTP Bistritsa

The establishment of UV installation for potable water treatment at the outlet of the PWTP Bistritsa is planned at the end of the period, which will not only improve further the water quality but will also allow the decrease in the stored quantity of chlorine gas at the plant and in this way its security will be enhanced.

The pricing of the project was done on the basis of preliminary market survey for the price of similar installations. Since the establishment of the installation is envisaged for the last year of the 5-year period, the changes in the operating costs for electricity

are expected to be reported just after 2021. The project is directly related to the levels of the KPI for the potable water quality (KPI 2).

Sofiyska Voda took into account the instructions of the EWRC under item 8.2 of the Protocol from the discussion held on 11.11.2016 and provides further justification for the project for UV disinfection system at the outlet of PWTP Bistritsa, as follows:
The use of chlorine and chlorine compounds for potable water disinfection ensures the destruction of a limited set of microbiological species – coliform bacteria and E.coli., as the efficiency of the disinfection decreases proportionately to the level of pollution of the treated water.

When conducting the monitoring of the raw water from the water sources in the period 2013-2015, cases were found of existing Salmonella spp. and Clostridium perfringens, in terms of which the disinfection with chlorine was not effective enough. The indications for the change in the microbe content of the microbiological pollution of the natural water give grounds to consider that as at the end of 2015, the risk was increased of the emergence of new polluters and higher concentrations in the water at the inlet of potable water treatment plants. Unlike the PWTP Pancharevo where the inflowing water is already chlorinated (which plays the role of further prevention and supports the process of microbiological treatment), at the inlet of PWTP Bistritsa the inflowing water is totally unprocessed. This increases additionally the risk of future deviations and impossibility of effective elimination of microbe pollution of this treatment plant. At the same time the only reliable and effective method for instant destruction of all potential microbiological polluters at the DNA level is the method with the UV disinfection at length of the wave of 254 nm.

In view of the above, at the end of the regulatory period, the establishment of UV disinfection system at the outlet of the PWTP Bistritsa is planned for the end of the regulatory period. It is envisaged that the system will be established only for the filters in operation and in compliance with the actual water volume since it is not expected the treatment plant to be used in its full capacity. The designing is planned for 2020 and it is expected the establishment of the system to start in 2021 and be finalized within the year. Due to that reason the effect on the potable water quality and the quantity of chlorine stored on the territory of the treatment plant will be seen just after 2021.

The implementation of this project is related to the fulfilment of the company strategy for maintenance of long-term level of 99% of the KPI 2a Potable water quality in big water supply areas, in view of the expected decrease in the water volumes at the inlet of the WS Sofia, which on its part will lead to decrease in the speed of the water in the impounding structures and distribution water pipes and increase the risk of sedimentation of organic and inorganic impurities and creation of favorable conditions of for microbiological growth. The only option for control on this process is

through thorough elimination of the option for microorganism replication. The processes of replication are possible in case at the disinfection the DNA structures of the microbiological polluters have not been fully destroyed, which cannot be done only with chlorine and chlorine compounds.

In view of the energy efficiency of the treatment process, it is planned the UV disinfection system to be established with individual module lamps for each of the selected filters. This will allow flexibility at the prevention works and repairs at the treatment plant, at rehabilitation of the filter cells as well as at servicing the very system for disinfection with UV light.

The expected costs for energy, consumables and maintenance of the UV disinfection system are given in the table below:

Cost element	Expected annual cost, BGN	Comments
Electricity	53402	The additional costs for energy is for the work of the UV disinfection installation
Quartz blocks	6560	Replacement of 22 per annum on average is expected (total in the installation - 220)
UV lamps, 60% on average from the lamps per annum	79 060	The lamps for UV disinfection are consumable with life around 14,000 hours
Savings from decreased chlorine consumption	5560	The expectations are for 20% decrease in the used annual quantity of chlorine in the water treatment process at PWTP Bistritsa
Total additional costs, BGN:	**133 462**	
Note: the change in the operating costs will be applicable only after 2021		
The calculations are made under the actual process from the potential supplier		

It is expected that the application of the additional disinfection with UV system will lead to decrease in the used quantity of chlorine at PWTP Bistritsa by about 20% after 2021; respectively this decrease is expected in the average daily reserve on the territory of the plant.

Installation of a new electrical switchboard in PWTP Bistritsa

The replacement of the old electrical switchboard is planned, which is required due to lack of spare parts on the market. In case an emergency situation arises, the

switchboard cannot be repaired, and this will result in lack of operation of the air blowers and the water pumps for backwash and it would be impossible to perform the technological processes related to potable water treatment. The implementation of the project is related to the indicator for continuity of the water supply and the one for the potable water quality (KPI 3 and KPI 2). The valuation was made with the prices for analogous projects.

8. Rehabilitation and modernization of buildings and facilities in PWTP Pancharevo

The project is based on the investment feasibility study developed and approved by the Expert Technical and Economic Council of the MoS - option 1 for keeping the existing technological scheme of the plant. The activities envisaged in investment feasibility study will be performed step-by-step, including the rehabilitation of buildings (filter house, chemical house, generator unit, workshop, garages), facilities (clarifiers, installations for disinfection and chlorination, outlet chamber), supply and installation of equipment, rehabilitation of internal site water mains and sewers, site roads, alleys and pavements. The valuation was made on the basis of the bill of quantities and prices from the feasibility study, updated with prices for analogous works from contracts under which the company works. Detailed design was prepared for the overhaul of the building of the filter house and the tender documentation for the selection of a contractor is ready. The implementation of this project is directly related to the KPI 2 and KPI 3.

9. Step-by-step rehabilitation of the filter cells in PWTP Pancharevo

Rehabilitation is planned for 8 filter cells in PWTP Pancharevo, including the drainage systems. The implementation of the project will allow reaching more efficient potable water filtration, decrease in the amount of the formed process water and decrease in the total consumption of electric power for treatment thanks to the decrease in the frequency of the washings.

The valuation was made on the basis of the preliminary studies of the prices of similar facilities and contracts of the Company.

10. Total capital maintenance of the PWTP

The funds are envisaged for major repairs of facilities or replacement of equipment in the potable water plants operated by the Company (PWTP Bistritsa, Pancharevo, Passarel and treatment plant Mala Tsarkva), which might arise unexpectedly in a period of 5 years and will guarantee continuous processes of potable water treatment. The valuation is based on the experience of the Company,

the observations for the amount of the costs of similar nature and the financial possibilities.

- *Reservoirs*
  The investment resources will be directed towards rehabilitation of dry cameras of reservoirs, water cameras of “Konyovitsa” reservoir, replacement of SVs in the reservoirs, construction of water meter shafts and installation of control meters, which will influence the levels of the KPIs for water supply continuity (KPI3) and for total water loss (KPI4).
  In 2017 the company plans on continuing work on the project for the construction of an additional capacity to the Murchaevo reservoir. Funds are envisioned for the completion of the construction. The realization of the project depends on the successful finalization of the procedures on the permission of the construction in the forest fund.

- *Chlorination stations*
  In the chlorination stations on the territory of the concession, where the primary and succeeding (secondary) chlorination is performed, for the period 2017 – 2021 a step-by-step rehabilitation of buildings and premises, replacement of depreciated technological equipment for chlorination of water and deactivation of released chlorine in the air is envisaged. Improvement of the efficiency of disinfection (decontamination) of the water on the way of the Kremikovtsi water main is envisaged. The realization of these investments will contribute to the reliability of the corresponding production processes and, respectively, to the fulfilment of the KPIs for potable water quality (KPI2).

- *Pumping stations*
  As part of the water supply project for Vladaya village with treated potable water from the city network the construction of a new pumping station in the village has been planned. The completion of this project will improve the service of water supply to the residents of the village of Vladaya and will influence the KPIs for water quality (KP2) and continuity of the water supply (KPI3).
  For the existing pumping stations investments are envisaged for the construction of a system for energy management, replacement of transformers and panels, construction of video surveillance system. Ty will contribute to the increase of the energy efficiency for the water supply activity (KPI11a), security and optimization of work processes.

- *Hydrophores*
  Replacement of depreciated and obsolete hydrophores (H) with new, energy efficient. The installation of control electricity meters on the hydrophores will continue and the major overhaul of separate buildings where the hydrophores

are located. The realization of the investments will contribute to the achievement of the long-term levels of KPIs for water supply continuity (KPI3), water supply system pressure (KPI6) and energy efficiency for the activity water supply to customers (KPI11a).

- *Rehabilitation and expansion of the water supply network over 10 m*
  In view of the achieved full coverage with water supply services the company does not plan on projects for the expansion of the water supply network. Separate short water mains are randomly constructed for the purpose of network binding and provision of water circulation, which improves its quality (KPI3). In the common case this does not lead to the connection of new customers, nor to increase in the total network length.

  (ПК11г). The investment resource is directed towards the rehabilitation on reconstruction of the existing network according to criteria, which considerably contribute to the achievement of the levels of the KPIs for continuity of water supply (KPI1), decrease of the total water losses (KPI4), decrease of the failures on the water supply system (KPI5) pressure in the water supply system (KPI6). The realization of these investments is the element with greatest weight for the realization of the set levels of the uniform quality indicator “rehabilitation of the water supply network” (KPI11d). The investment funds are directed towards rehabilitation and reconstruction of the existing network according to criteria, which considerably contribute to the achievement of the levels of the KPIs for water supply continuity (KPI3), decrease of the total water losses (KPI4), decrease of the failures on the water supply system (KPI5), pressure in the water supply system (KPI6). The realization of these investments is the element with the greatest weight in the achievement of the levels set of the uniform KPI “rehabilitation of the water supply network” (KPI11d).

  For the period 2017 – 2021 it has been planned via fractions of over 10 m length to be replaced or reconstructed 166 km of water mains, of which 17 km as failures. In the emergency replacement of fractions of water mains over 10 m long a tendency is observed for decrease of the failure incidences and, respectively, the planned length on an annual basis decreases from 3.7 km in 2017 to 3 km in 2021.

  In the planned rehabilitation the opposite tendency is set. In the first years of the period the company shall allot funds for investments in strategic mains and respectively the planned rehabilitated length of the distribution network will be smaller (around 20 km), as each year it will grow in such a way that at the end of the period it will reach values, satisfactory to the target level of KPI11d (over 35 km).

Along with the priority criteria connected to the KPIs, in the next regulatory period SV AD will continue to include into its investment program reconstruction and rehabilitation of water mains connected with the construction of a new sewer system and the implementation of the repair program of the MoS with regards to the transportation infrastructure in the municipality.

- *Water service connections*

The state of the water service connections (WSC) is key for the quality of water supply in the separate properties and buildings. It has direct relation to improvement of the level of the water supply continuity indicator (KPI3), decrease of the total water loss (KPI 4b), pressure in the water supply system (KPI6). In the period concerned funds have been provided for, with which it is expected to replace 7 262 WSC of an average length 9.8 m for reactive replacement and 21.6 m - proactive replacement. The estimations have been made on a historical base. In this figure WSCs have not been included, which are replaced as part of the rehabilitation of fractions of the water mains.
The provided funding (again on a historical base) for the construction of 300 new WSC annually by customers' demand is a factor for the fulfilment of the new customers connection to the water supply system (KPI14a).

- *Cranes and hydrants*

The replacement and installation of stop valves (SV) is an extremely important project from an operational point of view. Cranes are a major instrument for management of the network and the presence of working SVs in key positions of the network and in facilities is of critical importance. Investments in cranes directly contribute to the achievement of the levels of the KPIs for water supply continuity (KPI3), total water loss (KPI4b) and failures of the water supply system (KPI5). In Report 9 "Investment" to the investments for cranes are also referred those to the impounding water mains, distribution network, potable water treatment plants and reservoirs.

The replacement of fire hydrants is in the cases of failure of such (KPI4b), and the installation of new is in observation of the fire safety legal requirements. As far as the fire hydrants allow flushing and disinfection of the network in case of lack of drainage valves, their presence and proper functioning are related also to the maintenance of the quality of potable water (KPI2).

The funds provided for SV and FH have been estimated on historical base. In the planning of the investments for SVs the considerable modernization in this area in the past few years has been taken into consideration and a trend for

the number of installed SVs along the network to be decreased annually in such manner that at the end of the period to be twice as low.

- *Measurement at the inlet of WS*

The planned investments comply with the planned staged replacement of ultrasound water meters at the inlet of the WS with a new type of relative reconstructions or the building of new water meter shafts. The correct and reliable measurement at the inlet of the WS is the grounds of the correct calculation of the total losses decreases indicator (KPI4).

- *Zoning of the water supply network – control measurement*

SV AD has a long-term experience in the zoning of the water supply network. The meaning of this project for the optimal operative management of the network and the fight with the unbilled water volumes has been evaluated, for its implementation a lot of efforts and funds have been invested and in practice, to the end of 2016 the capital project for the construction of water meter zones of the water supply network has been completed, as to the end of 2015 - 206 water meter zones with end customers have been differentiated. The envisaged investments for the period 2017-2021 are for the replacement of measurement devices, reducers and loggers, as well as for the construction of new shafts and the installation of water meters for control and additional measurements on impounding and distribution water mains, through which capital maintenance, optimization of the built zone network and improvement of the measurement precision are performed. Investments will contribute to the fulfilment of the indicators for decrease of the total losses (KPI4) and pressure in the WS (KPI6).

The company provided additional information under item 9.2 from the letter of the EWRC, our ref.CB-1677/19.08.2016, concerning the budget under this project and the funds provided for ensuring all necessary control measurements in the scope of the water system, as it is presented in the table below:

Planned projects	2017 (k BGN)	2018 (k BGN)	2019 (k BGN)	2020. (k BGN)	2021 (k BGN)	Total (k BGN):
Program for zoning of the network for measuring (DMA) and for pressure (PMA)	607	630	648	667	704	**3 256**
Control measuring along the impounding structures to the main reservoirs	153	0	153	0	0	**305**
Control measuring at the inlet/outlet of the pressure pipelines	0	160	0	0	0	**160**
Control measuring of strategic water mains	0	0	48	320	324	**692**
Total:	**759**	**790**	**849**	**986**	**1 029**	**4 413**

The main capital activities will be focused on:

- Construction of water meter nodes for flange devices at all DMA water meters on water mains with a diameter less than Ø300 mm, incl. and/or water mains, which small water volumes pass through;
- Connection of the water meters at DMAs and PRVs to SCADA;
- Replacement of measuring devices, PRVs and loggers as part of the capital maintenance of the system;
- Replacement of boundary valves along the system, whose useful life has expired and they do not ensure the needed reliability at their operation;
- Transfer from SMS to GPRS communication;
- Construction of new DMAs and PMAs due to a change in the supply schemes, construction of new water mains or resolving individual local cases;
- Transfer to dynamic pressure management for zones, in which it is possible;
- Improvement of the measurement through relocation of the existing or construction of new measurement points on the impounding structures to the main reservoirs in the system;
- Construction of measuring points at the inlet and outlet of pressure reservoirs;

Improvement of the measurement through relocation of the existing or construction of new measurement points on the strategic water mains; The activities are divided mainly in two big groups – on the one hand, maintenance of existing devices and measuring points on the system, and on the other hand – improvement of the accuracy of the measurement and ensuring data in real time for the water volumes supplied in the strategic water mains and impounding structures, reservoirs, DMAs and PMAs. The average useful life of the measuring devices is around 5 years, which requires their gradual replacement in view of the maintenance of the system in good operational condition.

The better measurement and ensuring of the required level of monitoring, close to the real time monitoring, of the system will allow better prioritization of the activities, considerably earlier detection of deviations in the normal operation, options for optimization of separate zones or schemes for water supply, et The costing is based on the existing contracts for supply of equipment, market survey for the prices of the devices, actual values for the performance of the needed civil works and the needed resource on behalf of certain departments in the Company involved in the maintenance and the construction of DMA and PMA systems.

- *Pressure management*

To the end of 2016 the company plans on terminating its work on the capital project for building zones for pressure measurement and management. As of 2017 the investments will be used for capital maintenance, specifying in detail

and improvement/reconstruction of the built zones, as well as for the implementation of devices for dynamic pressure management. Other than the obvious connection with the indicator pressure in the WS (KPI6), pressure management is a key factor for the decrease of failures along the network (KPI5) and the total water losses (KPI4).

- *Research and modelling of the water supply network*

The hydraulic model of the water supply network, which will be terminated to the end of 2016 will continue to be maintained and updated, as for the purpose funds have been provided for licensed technical maintenance and upgrading of the work software with future versions. The hydraulic model is the basic instrument for detection of deviations from the normal operation of the network, simulation of interruptions in water supply, alternative supply schemes, water velocity in the network and others. The activities under the project are reflected in the indicator for total losses (KPI4), the indicator for failures of the water supply system (KPI5), indicator for pressure in the water supply system (KPI6), and allow the possibility for analysis of the activities related to the quality indicators of potable water (KPI2) and the indicator of water supply continuity (KPI3).

- *SCADA for water supply*

In the period 2017- 2021 the focus when extending the SCADA will be on the inclusion of new sites to SCADA – DMZ, DMA and PMA zones, pumping-hydrophore devices and important characteristic points from the water supply system. Establishment of a system has been planned for monitoring and visualization in real time of the qualitative indicators for the potable water in the distribution water network and connection of the systems for video surveillance of sites operated by the Company to SCADA. The investments are linked with the achievement of the indicators for water supply continuity (KPI 3), total water losses reduction (KPI 4), pressure in the WS (KPI 6), energy efficiency of the water supply activity (KPI 11a) (see also Section II. 6.2.1 Program for the improvement of the quality of the management of the WSS systems – systems and registers. SCADA).

- *Revenue meters*

In the context of the program for setting the meters in metrological validity and for the achievement of the set levels of the indicators for efficiency of setting the meters in metrological validity (KPI 12e) and efficiency of the installation and maintenance of the revenue meters (KPI 12f), the Company has planned investment resource for the replacement and/or installation of 15,200 water meters on water service connections with different diameter per annum.
In its reply under item 9.7. of the letter from the EWRC, our ref. CB-1677/07.09.2016, the Company provided detailed justification why no

resources have been provided for in the period 2017-2021 for remotely-read revenue meters.

In 2010 in order to determine the available technologies for remote reading, the opportunities and needs of SV, the company implemented a large-scale project, related to survey and analysis of the technologies available on the market. This approach is updated every year taking into account the development of the technologies.

The results showed that the introduction of one system for remote reading of water meters covers mostly water meters, which at the moment are with 2-year period of metrological validity of the subsequent inspection.

Provided that at the moment SV uses about 1,500 meters, which every 2 years should be inspected in a laboratory authorized by the State Agency for Metrological and Technical Surveillance, the following problems and additional cost occur:

- possible lack of compatibility between the supplied by the manufacturer type of meters and the selected technology for remote reading;
- replacement of meters, which are fit for use, with water meters compatible with the selected technology for remote reading;
- Replacing, setting and programming the components of the technology for remote reading

The costs related to extremely short period for inspection of the metrological characteristics of the water meters could be:

- for replacement of meters – on average BGN 420,000 per annum (costs for meters, spares for meters and materials, labor);
- For change of the setting and for programming of the components for the remote reading technology – BGN 100,000 per annum on average

Or in total, additional costs for meters related to the remote reading technology – BGN 540,000 per annum.

These costs will not be made provided that the period of validity of the subsequent metrological inspection is at least equal to the average period in Europe, which is 5 years. Such period is not just financially justified but in terms of technology, as well. Based on the last project of the Bulgarian Institute of Metrology and the analysis of the results, on average 96% from the water meters inspected every 2 years, “meets the approved type” .

In addition to the above-mentioned the main prerequisites for implemented and introduced technology for remote reading of water meters, are:

- installed revenue meter on each point of water supply;
- the revenue meters are in period of metrological validity;

- updated and correct deadlines for periodicity for follow-up inspections on the revenue meters;
- the revenue meters of the network should have the capacity for assembling the with the technology for their remote reading;
- the revenue meters should be compatible with the selected technology for remote reading;

Only after fulfilling the above conditions, it is possible and necessary to put aside resources and investments for the steps following the implementation of the remote reading technology;

- selection of a unified system for remote reading which will includes at least:
  - impulse output;
  - module ;
  - software;
  - devices (PDA + Bluetooth) for downloading data from water meters;

Up to date the condition of the revenue meters of Sofiyska Voda AD is the following:

- 74% efficiency of setting the water meters into suitability up to 2015 and in the end of BP 2017-2021 it is expected to be a little over 88%;
- More than 32 different manufacturers of water meters installed on the water supply network, some of them cannot be equipped with remote reading technology.

According to performed analysis the cost for a water meter to be equipped with impulse output and module for walk by technology is at least BGN 120.

- on average of BGN 40 for impulse output
- On average of BGN 80 for module

or expenses as follows

	Nos.	Unit price	Total
all meters	103 000	120 BGN	12 360 000 BGN
measured >10 ≤ 20 m3/day	8 000	120 BGN	960 000 BGN
measured >20 m3/d	1 800	120 BGN	216 000 BGN

These expenses do not include the following:

- the cost for replacement of water meters which are either not equipped with a technology for remote reading or will be incompatible with the selected technology;
- the cost for the software for data processing
- the cost of the mobile devices for the walk by system

The expenses for the last three conditions by multiple times exceed the indicated values for the equipment of water meters
The additional reasons on the basis of which the remote reading is not of high priority, are:

- absence of normative regulations of the obligatory requirement for implementation of technology for remote reading both of revenue and individual water meters;
- given that the control meters are owned by a customer, the required meters are not present, it should be necessary together with the implementation of the technology for remote reading of the revenue meters, the control meters be equipped with the same technology as well in order to
  - to read all water meters at the same time
  - to find out non-functioning or manipulated water meters
  - to reduce the so-called common needs consumption or a least to measure it really;
  - to find out the real losses in the internal network
  - The customers to have online access to their consumption.

These are the main reasons why up to this moment Sofiyska Voda AD does not envisage investments for remote reading of revenue meters and the main priority should be directed towards their setting into a period of metrological validity.

Investments for WS Non-potable water

The investments for this WS are fully in public assets. No extension is planned for this water network. In view of the bad condition of the water mains for industrial needs, the Company has planned significant sums for the rehabilitation of this system. All investments in this system are for replacement or reconstruction of sections from the water main, around 580 m long on average per annum.

INVESTMENTS IN PUBLIC ASSETS FOR SEWERAGE

- *Sewer pumping stations*

The sewer pumping stations the company operates with have been built in the last 8 years and still do not require a serious investment resource for capital maintenance. In order to guarantee their problem-free operation, the company has planned limited funds for *ad hoc* needs. 500 000 BGN have been provided for the purchase and installation of a diesel generator for Novi Iskar SPS. The maintenance of SPS contributes to the achievement of the level of the KPI for sewer services coverage (KPI7). In its reply to the EWRC, with regard to the letter our ref. CB-1677/28.07.2016, Sofiyska Voda made a further clarification that the planned

resources in limited annual amount (20,000 BGN) are for capital maintenance of the facilities, as the specific activities for which they will be spent will be determined by the asset condition and they will be decided on dynamically. For that reason it is not possible to base our assumptions for the number of the SPSs, which will be a subject of investments on an annual basis, on objective considerations. Their annual number will not exceed 4, and in any of the years (excluding 2018 when the realization of the reserve independent power supply is planned for the SPS Novi Iskar through a diesel generator is planned) it may be 0.

- *Rehabilitation and expansion of main sewer collectors and branches and rehabilitation, expansion of the sewerage network over 10 meters*

  Sofiyska Voda JSC invests into expansion of the sewerage network in strict agreement with Municipality of Sofia and according to the determined by it priorities. In 2017 the company will finish the construction of the sewerage network in the village of Voynyagovtsi, the sewer along Lazar Mihaylov Blvd. in Benkovski R.Q. and along Stefan Dyunov Str. in Moderno Predgradie r.q. In the next years the development of the network in Gorublyane r.q, Moderno Predgradie R.Q., Simeonovo R.Q. and Benkovski r.q will continue. Up to the moment the concrete contents of the program for investments into new sewers is still in process of specifying. The indicator for covering with sewerage services (KPI7) will be affected. The expected length of the built new sewers is about 14 km.

  In the relation to the planned reconstruction of sewers, team of the company has analyzed the operational issues along the network and has prepared a program for reconstruction of sections from the network in the next 5 years. A special focus of this program is envisaged for rehabilitation of sewers in the central city part. Reconstruction is planned of about 10.2 km of the sewerage network.

The funds for emergency rehabilitation of sections of the sewerage network are planned on historical basis. Funding is envisaged also for rehabilitation of overflowing shafts and overflow channels. The implementation of the conceived projects in the envisaged scale and investment value will contribute to improvement of the services for the customers and will affect positively the following indicators for the quality of the WSS services – quality of the raw waste waters and of the treated waste waters (KPI8), failures of the sewerage system (KPI9) and flooding of properties of third persons caused by the sewerage network (KPI10). With regard to the letter of the EWRC, our ref. CB-1677/28.07.2016, that in **Report 9** detailed information about the natural indicators of the planned investments should be filled in – length, number, etc., Sofiyska Voda clarified that due to the requirement for the constructed/rehabilitated trunk sewers to be accounted as assets after the receipt of the permit for use, in order to achieve compliance of the data in **Report No.9 Investment program** with the ones for the increase in the sewer network, when specifying the natural indicators, the technological time has been taken into account

(3 – 6 months), needed for the fulfilment of the administrative procedures for the approval of the constructions. For this reason, the sewers which were physically constructed in the previous year are reported as natural indicators in the next one. The cell for a natural indicator for 2020 does not contain information because in 2019 no investments are planned in the trunk sewers and the sewer branches.

- *Sewer service connections (SSC)*

On historical basis the company has envisaged in its investment program funds for replacement of sewer service connections (KPI 10) as well as for construction of new ones upon customer requests (KPI 7 and KPI 14 b)

- *SCADA for sewerage*

Construction of a system of points for monitoring is envisaged in typical points of the sewerage network equipped with devices for registration and transfer in real time of hydraulic and quality indicators of the wastewater visualized in SCADA (See also 'Monitoring of the sewerage network') In its reply to the EWRC, with the letter our ref.CB-1677/28.07.2016, the Company informs the Regulator for the technical omission when filling in the Report No.9 about the lack of specified natural indicators for SCADA for the wastewater treatment. The budget for the investments in technological and energy SCADA for treatment has been calculated on the basis of the costs for past periods and it has been envisaged for 55 points in total per annum, as for points we have in mind the connection of a new site, new device, connection of new communication, controller, etc. The higher sum envisaged for 2017 is also intended for purchase of licenses for SCADA for the wastewater treatment.

- *Survey and modelling of the sewerage network*

The hydraulic model of the sewerage network gives ample opportunities in two main directions - conceptual planning of the future development of the sewerage network and in parallel with that – survey, analysis and diagnostics of the work of the existing sewerage network. The building of hydraulic model of the sewerage network is a complicated and labor-intensive process mostly because of the limited time for organizing campaigns for collection of data for work in the network - they can be performed in the two most rainy seasons and that is - the spring and the autumn. In addition, the survey and analysis of the work of the sewerage network is a more resource-consuming process than the one of the water main network due to a number of reasons – insufficient amount of available information, seasonal limitations, a more impeded access to the facilities, necessity from longer time intervals for taking the measurements, etc. Meanwhile, the work on the hydraulic model of the sewerage network gives opportunity for implementation of joint projects with other departments of the company for survey, analysis and modeling the work of the two networks (water main and sewerage), detection of infiltration of

potable water in the sewerage network, collection and maintenance of database with the operational events along the sewerage network, structuring and analyzing of the information from CCTV surveys of the sewerage network, etc.

In the next regulatory period, the company envisaged to increase the efforts and accelerate the rate for building of detailed models of the sewerage network with which to significantly improve the capacity for analysis of the work along the network, initiating of proactive works on the network, in order to avoid future problems, identify the needs from rehabilitation, replace and construct new sections, etc.

In its reply under item 9.4. of the letter from the Regulator, our ref.CB-1677/07.09.2016, the Company provided clarifications for the planned costs for other special equipment for the sewerage for the period 2017-2021.

The main activities included in the project are:

- survey of sewer service connections;
- analysis and processing of operational events on the sewer network;
- analysis and processing of CCTV surveys;
- survey of sewer shafts and facilities;
- maintenance of the network with rain gauges on the territory of Sofia and the respective analysis and processing of data obtained from them;
- measuring water volumes along the sewerage network
- impermeable area surveys (IAS) in order to calculate the actual drainage coefficient;
- building detailed hydraulic models of the sewer network;

The main results from the project activities are obtaining of detailed information about the sewer network, analysis of the reasons for arising of operational events, finding the critical points and better planning of the investments in the sewer network, collecting the required data for creation and calibration of the detailed hydraulic models of the sewer network, etc.

Since the hydraulic model of the sewerage network is carried out mainly with internal company’s teams, pricing is made on the basis of real expenses of the department and the necessary resources to ensure the performing of the necessary activities. In order to speed up the building of the hydraulic model of the sewerage network which allows for its completion by the end of the concession agreement, as of 2018 additional finances are planned which would give the opportunity for increasing the resources and the volume of the activities necessary for the complete establishment of the model by 2025.

Additional information about the project Sewer Network Hydraulic Modeling: Sofiyska Voda provides information with regard to item 8.3 of the Protocol from the discussion held on 11.11.2016 for the project Sewer Network

Hydraulic Modeling. The latter is a strong tool for the preparation of a proper evaluation of the condition of the sewer network, the proper prioritization of the investment projects, identification of potential problems and undertaking proactive measures for extending the life of the individual assets. Building up the detailed hydraulic model of the sewer network is a long-term project of Sofiyska Voda, which so far has been implemented entirely by a company team.

With the available internal resources of the Company it is possible to build maximum two detailed hydraulic models of the sewer network per year. The first detailed model was completed in 2016, as till the completion of the model another 18 zones are to be surveyed, measured and modelled, with which the sewer network in the MoS will be fully hydraulically modelled.

The main reason for limiting the scope of activities, which may be performed with internal resource, is the impossibility of holding measuring campaigns all the year round, which creates impossibility of speeding up the activities through the optimization of the activities and processes related to model building.

In view of speeding up the activities for building the hydraulic model of the sewer network, from 2018 outsourcing is planned for part of the survey, measuring and modelling activities for maximum 50% of the detailed models. Since the value of the activities completed by a subcontractor cannot be forecasted in detail, the accepted increase in the value of the project from 2018 is a little above 35% of the costs of Sofiyska Voda for the work of the Company team, committed to building the hydraulic model of the sewer network, and for them maximum 50% of the sewerage zones will be surveyed, digitalized and modelled, which are to be built in the hydraulic model.

Хидравлично моделиране на канализационната мрежа мрежа	***2017***	***2018***	***2019***	***2020***	***2021***	***ОБЩО***
Вътрешни ресурси	350 000 лв.	350 000 лв.	350 000 лв.	350 000 лв.	350 000 лв.	1 750 000 лв.
Външен подизпълнител	-	130 000 лв.	130 000 лв.	130 000 лв.	130 000 лв.	520 000 лв.

Through outsourcing part of the survey, measuring and modelling activities for the sewerage zones, doubling the rates of building the detailed hydraulic model of the sewer network will be achieved, which will allow its completion at the end of the regulatory period in 2021.

INVESTMENTS IN PUBLIC ASSETS FOR WASTEWATER TREATMENT

The planned investments for wastewater treatment plants are directed towards a further optimization and enhancement of the efficiency in the treatment processes (KPI8 – quality of wastewaters treated), increase of the energy efficiency of the plant (KPI11b), provision of safe and healthy labor conditions, complying of the buildings fund with the legal requirements for energy efficiency (KPI 11b) and seismic stability.

The basic projects, planned for completion during the regulatory period 2017-2021 in connection with the wastewater treatment are:

- Construction of a new sludge digester with volume 7000 cubic m.
- Overhaul and repair of the existing 4 sludge digesters
- System for treatment of sludge waters
- Construction of an automatic analysis station on the quality of waters also at the inlet of the Sofia Wastewater Treatment Plant Kubratovo
- Expansion and development of the SCADA system for technological and energy management

Additional information in reference to the investment projects which will are to be realized in Kubratovo SWWTP has been presented in the Technical part, section IV.4.2 of the Business Plan.

1.1.3. Investments in systems, registers and databases

Development of the existing systems:

A considerable investment resource is provided for the development of SCADA for water supply, sewerage and wastewater treatment. Along with the technological management, the effective systems SCADA extend their scope in the aspect of the energy management of the facilities.

The development of the GIS and the system for management of operational events ‘Pegasus’ is planned through adding new functionalities.

The development of the customer information system SAP will continue. The need of implementing SAP BW appeared in the process of its implementation. At present this important part of the process, generating all types of reports, works with insufficient resources. In case of failure uncertain period of time will be needed to restore the process, which will result in interruption of a number of business processes. Through providing appropriate resources for this system and having a disaster recovery solution in place, stability of the system will be ensured – all required reports will be generated within the required deadline and with the necessary reliability. Based on the new resources, it will be possible to develop additional reports and services, supporting the managers in the decision-making process.

In the period 2019 – 2020 update of the lab management software has been provided. The expectations after the implementation of new software developments are that the time for reporting of data from analysis will be reduced; automated evaluation of the compliance level; option for reporting in real time the deviations from the quality. These improvements will have an impact on the response time at the operational and corrective activities on the water network, servicing reservoirs and WWTPs and PWTPs.

Information about the existing information systems and plans for their development is given in section 6.2 Program for improving the management of the WSS systems – systems and registers from the Technical part of the business plan.

Implementation of new information systems:

- *System for integrated resource planning (ERP system)*

At present the processes in the individual directorates, generating the main activity of the Company, are not integrated. Each directorate plans its activity and in its coactivity with the other directorates paper documents are generated, which are manually delivered. This takes labor resources and leads to a delay in the processes. In order to optimize the processes and increase the efficiency of the company, a decision was made for implementing an automated system, which integrates these processes – ERP system. The preparation of terms of reference and conducting of tender procedure for selection of a contractor is planned for 2017 and for 2018 and 2019 – the system to be developed and implemented. Thus in addition to increasing the work efficiency, the information transparency and security will be increased.
With regard to an item from the Protocol of the meeting held with the EWRC, Sofiyska Voda provides the following further information in relation to the project:

The ERP (Enterprise Resource Planning) systems are software applications for overall management of the business processes in the Company, which support the automation and optimization of the everyday activity of the company, thus helping it to cope with the specific challenges in its sphere of activity. This type of software solutions have been for a long time a standard in all big companies, including the utility sector, as most frequently the implemented software systems of this type are SAP, Oracle and Microsoft. The ERP system is a computer integrated, multi-dimensional and multi-functional system, established on the basis of a customer-server technology, based on the business model for planning, control and global optimization of the overall logistic chain of the process of supply, production and the relevant accompanying them financial operations. The basis of the ERP systems is the integration of all data and processes in a common unified platform. An integral part of most ERP systems is the common database for all processes. It contains the operations, structures and description of the processes in the enterprise. As a standard all modules store their data in this base and the information has an overall view of the functioning of the enterprise. Any ERP system is established on the basis of the activities performed in the organization and repeats the structure of the enterprise. The system is flexible and changes in the structure of the organization do not have an impact on its use. In the ERP system no independent and unlinked units are defined, for example, the stocks not

reflected in the accounting department or accounting reporting, which is used only for official needs and is not an actual activity of the enterprise. At the same time, through the ERP system all Company indicators are monitored, for example the costs for materials, stocks, general production costs, cash flows. This is done globally and it is part of one system. It can be summarized that the integrated system for business management is a method for effective planning and control on the financial and business activity of the enterprise, which is the basis of the integration of its information flows. The ERP systems are built is such way that they ensure a constant information flow among the different modules and their functional applications.

The accumulated experience so far shows that the advantages of the use of the ERP system are many and the effect in the enterprise is highly positive. As a whole the following key advantages can be enumerated:

- improvement of planning the resources and activities;
- full control on all units in the enterprise;
- standardization of the management and easier decision-making process;
- simultaneous monitoring of all factors from the business processes without a possibility of “forgetting” an important element, for example, whether there are financial resources;
- Possibilities for a more complex analysis of the results and achieving the best business practice;
- Integrated management of the business cycle of work – revenues and payments, stocks, income and expenses, profit;

Our forecasts are initially for the ERP system of Sofiyska Voda AD to include the following modules:

- Customer Relationship Management – existing module.
- Engineering
- Asset Lifecycle Management
- Financial Management
- Project management
- Supply Chain Planning
- Supply Chain Execution - Logistics
- Supply Management - Procurement

In the table below functionalities of separate modules have been listed as examples:

Modules	Functional applications
Financial Management	1. Accounting 2. Cash flow management 3. Sales and receivables 4. Deliveries and debts 5. Fixed assets
Stock Management	1. Warehouse 2. Orders and contacts

	3. Planning and execution 4. Management of ordered goods 5. Warehouse stocks
Project Management	1. Projects 2. Resources
Activities Management	1. Contract management 2. Order processing

It is expected for the system to bring the following benefits for the company:

- Integration into a common database of information we are currently keeping in a multitude of working files in Excel format. In this manner the time will be reduced for processing information and generating reports, as well as the risk of errors will be reduced.
- Control over the document versions and access of all interested persons to the respective valid information in the database, by which errors will be avoided with the use of obsolete data.
- Speeding up the process of approving “requests for delivery” through electronic verification and authorization;
- Optimizing inventory, eliminating the risk of overstocking or lack of materials, reducing the value of working capital.
- Optimizing the processes in the implementation of projects by improving logistics planning and the activities on the implementation.
- By controls in the system and electronic notifications the risk will be eliminated of missing steps of the work processes and/or notifications related to the implementation of the investment program. There is a direct relationship with the requirement for the implementation of Quality Management Systems to the end of 2019 (art. 74-76 of the Instructions on the Application of the Ordinance on the Regulation of the Quality of WSS Services)
- It will allow the preparation of system analyses of the activity according to various criteria, which will be the grounds for making management decisions and planning the financial, technical and human resources of the company.
- Reducing the amount of paper used mostly by replacing the requests for materials from the warehouse with electronic (each request is currently been printed in 4 copies).

Our expectations are for the practical benefits to be reflected on the optimizing of the internal company processes, reducing their time and the use of exactly the necessary technical, financial and human resources, as the implementation of the ERP system is not expected to definitely have a direct relationship with the reduction of operative costs. The expectations are with the implementation of the system the efficiency of the employees to be increased (i.e. without a

change in the number of the company employees more and a wider diversity of tasks could be undertaken and implemented) and the relations with the customers and business partners could be improved.

The implementation of a real ERP system passes through several stages:

1/Consultations on the implementation of the ERP system
The consultations on the implementation of the system include a basic analysis of the customer needs and their activity, as well as an assessment of the possibilities of the system for work in the enterprise and its economic impact for the client. During consultations a plan is elaborated for the execution of the real work towards the adaption of the system and the necessary set of functional modules.

2/ Study and design
The stage of studying and design of the system includes an analysis of the business processes in the enterprise and a selection of the work modules in real conditions for the particular customer. The study is made on the basis of real activities of the enterprise and is a process involving both parties for a detailed description of all processes. A specialist of the ERP system offers optimization of the work process and draws up a plan for improving the organization of the enterprise.

3/ Adaption of the system for the concrete customer
The adaption of the system for a concrete customer is the process of customizing, allowing access to the modules for each work place and the creation of the links between the various departments and units of the enterprise. In this moment a change of the system can also be made, so that it complies with the concrete customer needs. In the process of adaption are constructed the documents, the links between them and all system requisites necessary for the customer are added. At this moment the documents are modified in order to contain the company requisites, personal reports, specific fields or other individual modifications. The process terminates with training of the employees and real input of enterprise data.

4/ System maintenance
The system maintenance guarantees its operability, updating and modifications depending on the changing statutes or business rules. Maintenance includes replacement of components or whole modules, adding new functionalities or modification of existing ones in a way guaranteeing the most efficient operation of the whole system. The

maintenance is a constant factor of development and it ensures its long-term applicability in the enterprise.

The expected benefits of the use of business management systems are related to the possibility to take adequate management decisions, optimization and automation of basic business processes, increase of employee efficiency, improvement of the relations with the customers and business partners. The implementation of the system will lead to decrease of part of the expenses by saving time and improves the control in the organization.

From a technical point of view the resource planning project will include the following main components:

a. Software licenses for end users;
b. Hardware – servers, disk area, communication equipment;
c. Licenses for OS, virtualization and back-up copying;
d. Implementation services.

The following capital costs are planned in relation to its implementation:

i. End user licenses. 200 licenses have been provided for. The budget value of one license is around 1,600 BGN and it depends on the producer. The total value of the licenses is 345,000 BGN.
ii. Hardware. For the listed hardware a total of 160,000 BGN have been provided. The values are based on current budgetary prices of the hardware equipment used in Sofiyska Voda AD.
iii. Licenses for OS, virtualization and back-up copying. For the listed licenses a total of 80,000 BGN have been provided. The values are based on budgetary prices for that type of software used in Sofiyska Voda AD.
iv. Implementation services. Normally, this is a project requiring at least one year of work on the implementation. 300 days have been taken as a basis. Usually at least 8 people work on such a project. The payment rate of one specialist is between 90 – 100 BGN per hour. 100 BGN per hour are taken as a basis. The total value of the services in this case comes up at 1,920,000 BGN.

The amounts under items i-iv come up at approx. 2,500,000 BGN, provided for capital expenses.

Operative costs. The operative costs in the first year of operation of the system will be negligibly low. The following operative costs have been envisaged for the next years:

v. Software support of the licenses. After the first year software support of the licenses is paid as the normal practice is 22% of the value of the purchased licenses. This is around 75,000 BGN per year;
vi. Software support of the licenses for OS, virtualization and back-up copying. Usually these licenses are provided together with the hardware and come with a 3-year support. Operative costs for them will appear after the third year. By the present effective budgetary prices of such software used at Sofiyska Voda AD, this makes around 15,000 per year;
vii. Hardware maintenance. Normally hardware is supplied with a three-year warranty maintenance. Operative costs will appear after the third year of operation. The expected annual expenses are around 35,000 BGN;
viii. Vendor support. In the first year of operation this cost is normally 0 BGN. In the following years the operative costs will depend on the number of man-hours that will be used.

· *Implementation of a new system for Call Center*

The existing solution was implemented 7 years ago and is based an obsolete technology. There are hardware components, which are no more produced, they are difficult to find at the market with very high prices. In case of possible failure, the restoring of the system will take a lot of time, which will result in interruption of a main business process. The company which implemented the solution is the only one which could maintain it and takes advantage of it and imposes conditions on SV. A decision is made for implementing a new solution for the Call Center, based on modern technologies, which could be maintained by many customers. Thus the security of the system will be increased and the risk will be reduced of interrupting a main work process, and at the same time the solution will be modernized and easy to upgrade.

·*Implementation of a system for monitoring and management of the water meter zones on the water network*

In 2015 a platform was tested in the Company for monitoring of certain water meter zones and a decision was made for automated balance of the zones and automated assessment of the leaks with a focus on the economic aspects of their decrease. The data are collected automatically and through assessing certain economic and technical indicators, the assessment of the work of each zone is made.

In reference to it. 9.6 of letter №СВ-1677/19.08.2016 of the EWRC in the table below Sofiyska Voda has specified the values (determined on the basis of preliminary research and the Company’s experience) and the distribution of the planned expenses per years for the projects described above in details.

Planned projects	2017 (k BGN)	2018 (k BGN)	2019 (k BGN)	2020 (k BGN)	2021 (k BGN)	Total (k BGN):
Software for laboratory management Win Lims – renewal	9	0	150	0	0	**159**
System for monitoring and management of the water management zones along the water supply network	0	125	5	5	0	**135**
Purchase of licenses for the existing information systems	77	153	88	51	51	**421**
Construction of a disaster recovery center for the customer information system	600	0	6	0	0	**606**
Corporate web site – renewal	20	10	10	20	20	**80**
New system for the Call Center	250	0	0	0	0	**250**
"Information center" – development of the functionality	50	10	10	10	10	**90**
Software application Pegasus – development of the functionality	60	30	30	30	30	**180**
Customer Information System – development of the functionality	50	20	20	20	20	**130**
ERP system	0	1 000	1 500	0	0	**2 500**
Total:	**1 116**	**1 348**	**1 819**	**136**	**131**	**4 551**

In the table above projects have been specified, directed towards the improvement of customer service and in compliance with the company strategy for the regulatory period. Such projects are: a new system for the Call Center that includes the implementation of IP telephony with considerable improvement of the functionality of the Call Center; development of the customer information system, which will improve and enrich the functionality of the implemented CIS; implementation of an integrated resource planning system (ERP). With the implementation of the ERP system it is expected process management to be improve considerably, as well as control over separate activities and the quality of data. Using the new system activities will be integrated, which to the moment have been serviced by various software systems – finance, procurement, commercial activity.

In connection with it. 8.1. of the Minutes from a meeting conducted on 11.11.2016, signed between Sofiyska Voda and the EWRC, the Company is providing the following additional information in reference to the effect of the planned investments on the efficiency of the Company staff.

Sofiyska Voda AD does not provide for an increase of the staff as a direct consequence of the planned investment projects. It should be borne in mind that with Business Plan 2016 the Company had planned an increase of the personnel by 14 persons, as in the current year (2016) only one of the

envisaged positions was opened. It is planned for the remaining positions to be opened during the new regulatory period 2017-2021. Moreover, with Business Plan 2017-2021 the opening of 10 additional positions has been envisaged, as the plans are for 7 to be opened in 2017, and the remaining 3 in the period 2018 – 2021.

The planned increase of the positions (by 10 pos.) with the present Business Plan has been invoked by the necessity for optimization of the activity of the Company as a consequence of already realized projects and other planned initiatives of the Company. The following types of positions will be opened (in IT and H&S departments):

1. IT security officer. In connection with the ensuring of the continuity of the processes in Sofiyska Voda AD it is necessary to prepare, introduce and implement a Business Continuity Plan (BCP). This plan is obligatory for the Company due to its strategic function. It is required also by the annual audits conducted at the Company. A part of the BCP is ensuring the security of the IT systems of Sofiyska Voda. The BCP is a continuous action that must maintain the plan current, which requires regular check-ups, updates and tests. In this regard, as well as in regard to the increase of the number, complexity and intricacy of the current attacks on the IT systems, and in compliance with the good practices in the management of these processes the necessity was established of a specialist with specific knowledge related to the security of the IT systems.
2. ABAP developers. After the implementation of the new customer information system (CIS), the IT Directorate is one of the units responsible for the adaption of the functionality of the system to the changing business processes at the Company. The new CIS is SAP IS-U, in which all changes are made by means of the ABAP programming language, especially developed by SAP. After an analysis made as a consequence of the twenty-month operation of the system, the need was established of a specialist with knowledge of the ABAP programming language. The specific cases, which are resolved and will be resolved with programming in the ABAP language, require that the developer also has excellent knowledge of the processes at Sofiyska Voda AD. This imposes the necessity of hiring such type of specialists.
3. Senior specialist. This is in fact a SAP basis specialist. After the introduction of the new CIS at Sofiyska Voda AD and on the basis of the current operation of the system the need was established of specific administration positioned between system administration and administration of the actual application. After consultations with the partners who implemented the system and SAP Bulgaria it proved that this specific type of activity according to the good practices of the producer

company must be done by a separate specialist called “Basis administrator”. Due to the significance of CIS for the work of Sofiyska Voda hiring such specialist to take care of the operability of the system is necessary.

4. Senior Internal Audit Specialist. With a view to the increasing statutory and corporate obligations of the company to maintain various certifications following a great number of standards for the guaranteeing of the quality of the flowing processes, as well as to report and cover different risk management requirements (for instance, CAP) it is necessary to open such position.

„With regard to the necessity for the WSS operators to achieve compliance with the requirements of the EWRC for certification in terms of quality and H&S management - ISO 9001, ISO 14001, OHSAS 18001 (ISO 45001) and from internal-organizational point of view – optimization of the work processes in the Company and enhancing the quality of the processes and services, the opening of the following positions is required:

1. Senior Manager *Quality Assurance* with the main duties: to organize and manage the preparation of SV for the implementation of standardized systems for management in different activities of the company; to communicate and work with the certifying authorities; to prepare action plans and work programs to address the weaknesses in the management systems; to be fully responsible for the functioning and integration of the certified management system ISO 9001, ISO 14001, OHSAS 18001 (ISO 45001), etc.

2. Specialist *Certified Management Systems* with the main duties: to actively support the work of the Senior Manager *Quality Assurance* by developing procedures together with all colleagues from all activities of the Company and the relevant documentation required under the certified management systems (ISO 9001, ISO 14001, OHSAS 18001 (ISO 45001)); to participate in the internal audits of the management systems; to participate in the certifying process for the management systems and the work with the certifying authorities, etc.

3. Specialist *Maintenance and integration of the management systems* with the main duties: to actively support the work of the Senior Manager *Quality Assurance* in the development of the programs for implementation of systems for management all Company activities; to participate in the review of the work processes, development and revising of procedures together with colleagues; to participate in the internal audits of the management systems; to participate in the certifying process for the management

systems (ISO 9001, ISO 14001, OHSAS 18001 (ISO 45001) and the work with the certifying authorities; to identify the possibilities of improvement and integration of the existing systems for management of the processes in the Company; etc.“

The increase in the number of the staff has been planned in order to achieve the optimal number of employees necessary for the effective fulfilment of the planned activities and future challenges for the company. The investment in human resources is extremely important for a company like Sofiyska Voda, whose activity is of high public importance. The involvement of new experts will enrich the knowledge in the Company and ensure the required capacity and competences, which will allow the business processes in the Company to run in an effective and efficient way. No doubt, the improvement of the Company activity is related not only to the existence of technical and financial security but also to the existence of qualified personnel with specific competences. The planned new positions are namely with such orientation. It should be taken into account that the labor market in Sofia is one of the most dynamic ones and to attract not only qualified but lower qualified staff is sometimes a problem for the Company. One of the main focuses of the Company has always been related to the maintenance of high H&S standards, i.e. some of the planned new job positions (H&S and Internal Audit) will contribute to the achievement and maintenance of these priorities.

In conclusion, we believe that the presence of the needed professionals is the best guarantee for achieving a positive effect on the quality of the productivity, motivation of the employees and satisfaction of the end users of the services in the Company.

With regard to item 8.5 Protocol for public discussion dated 11.11.2016, signed by Sofiyska Voda and the EWRC, the Company provides a further justification for the development of a solution for recovery of the customer information system in emergency cases. The implementation of this project is required due to:

- Requirement of the Personal Data Protection Act, which requires mandatory reserve copying of the data and storage of the reserve copy at place different from the main one.
- Being a Company with strategic importance, the Company should have a common action plan for disasters and failures. The IT systems, servicing the main business processes of the Company, should be part of this plan.

The pricing of the project is made on the basis of the budget studying of the licenses needed for developing a solution, the needed hardware and implementation services, including:

- Licenses for the operational systems, licenses for virtualization and licenses for ensuring the reserve copying in the reserve data center. BGN 120,000 is budgeted for these components. The value is based on the current budget prices of licenses, used in Sofiyska Voda.
- Additional hardware for upgrade and virtualization of the existing disk array. BGN 250,000 is planned on the basis of the current budget prices for hardware used in Sofiyska Voda.
- Additional hardware, including disc array, servers, SAN switch and tape library in the reserve data center. BGN 230,000 is planned on the basis of the current budget prices for similar hardware used in Sofiyska Voda. The expense is planned on the basis of the current prices for maintenance, which Sofiyska Voda pays at present for such type of hardware and software.

The operating costs related to it are ensuring of hardware and software maintenance after the third year of operation. Under the currently effective process, it will be between BGN 30 – 40,000 per annum.

Regarding the project for the development of the functionality of the customer information system, the costs are based on the development made in addition in 2015 and 2016, as a higher sum is planned for 2017 because higher number of further developments is expected, which should decrease in number over the next years. The additional developments do not generate operating costs if they are not related to buying additional licenses.

1.2. LINK BETWEEN THE INVESTMENT PROGRAM AND TECHNICAL PART OF THE BUSINESS PLAN

Sofiyska Voda's investment program is based on the proposals for investments from the operative managers in different spheres of the activity of the Company, prioritized in conformity with the current condition and necessity of development in order to achieve the objectives of the business and the levels of the KPIs as set in the regulations. There are specific projects behind every planned sum in the investment program with certain expected results, which will contribute for providing services with high quality and increasing the efficiency in all spheres of the activity and firm focus on the safety and security. The breakdown per lines in Report 9 'Investment program' is in conformity not only with the type/group of assets but also with the set depreciation quota. The investment projects are reviewed also in the respective analytical sections and programs for development in the Technical part of the Business Plan.

The natural indicators, which the Company expects to achieve with the planned investments, are given in Report 9 'Investment program' from the price model. When filling in the data for the achieved and expected natural indicators, volumes for the main results are shown, in line with the measurement unit provided in the report. For example, for the 'impounding structures' only the length is given of the water mains

planned for rehabilitation, without specifying the shafts, gates, etc. planned for rehabilitation. The valves, which the Company plans to replace along the impounding structures and distribution water mains, as well as these in the reservoirs and PWTPs are summarized on the line for valves and hydrants. On the other hand, the stop valves planned for replacement at the WWTP Kubratovo is referred to 'Other special equipment for the WWTP' in order to properly reflect the depreciation quota. For component assets like treatment, pumping, chlorination stations, etc., the number of sites is specified in the cells for the natural indicators (for example, stations), in which the investments will be made. On the line 'Administrative and service buildings and constructions' the data are shown only for buildings, which are not part of the technological complexes (work bases, customer service centers). The investment costs for the buildings, which are part of Beli Iskar, the treatment plants, reservoirs and hydrophores are given on the lines for the respective assets.

2. DESCRIPTION OF THE MECHANISMS FOR FINANCING THE INVESTMENTS

2.1. INVESTMENTS FROM OWN FUNDS IN OWN ASSETS

The investments in own assets for Business Plan 2017 - 2021 will be financed with own funds. The acquisition of vehicles under financial leasing contracts – following the discussion with the EWRC at the conducted trainings and working meetings – is not presented separately as an investment loan, but in Report No.19 Rate of Return, from the electronic model for the Business Plan 2017 -2021 the specified balances on line *2.3 long-term loans, with which assets have been acquired under financial leasing contracts* reflect the proper forecast balances of the unpaid principals under such contracts.

2.2 INVESTMENTS WITH BORROWED FUNDS IN OWN ASSETS

See the comments above under item 2.1.

2.3 INVESTMENTS FROM OWN FUNDS IN PUBLIC ASSETS

The investments in public assets will be financed with own funds from the generated operative cash flows.

SV submitted additionally information as per it. 9.3 from the protocol on the public discussion dated 11.11.2016 signed by the EWRC regarding the envisaged investments for the wastewater treatment service in accordance with the costs for depreciations and amortizations of public assets, constructed by own resources. In order to reach faster the target levels of the KPIs and enhance the efficiency of the work, the company planned bigger volume of investments to be implemented during the first two years of the period. The investments in wastewater treatment in BP 2017-2021 are planned in view of the technological needs for the processes of

treatment of wastewater, maintenance of the assets in good operational condition and achievement of the relevant KPIs and efficiency. The high amount of the investments in the first two years of the regulatory period results from the planned for implementation projects for construction of a new digester (3 M BGN), overhaul of buildings for achievement of energy efficiency (0.9 M BGN), construction of a system for treatment of wastewater, formed in the treatment process (0.5 m BGN), purchase of laboratory equipment for wastewater tests (0.6 M BGN). Additional distribution of investments would mean artificial extension of the deadlines for implementation of the big projects.
In connection with a question put forward as per it 9.3 from the protocol about the discussion conducted on 11.11.2016 for change of the investment profile for wastewater treatment service in accordance with the costs for depreciation of public assets, constructed by own funds, we provide the following additional clarifications:

In 2021 for wastewater treatment service the difference in the costs for depreciation of public assets, constructed by own funds to the investments in public assets and the costs for the principals by investment loans is a positive number to the amount of 1,467 k BGN (line 6.2. from Report No 10) due to the following circumstances.

In 2021 for wastewater treatment service the difference in the costs for depreciation of public assets, constructed by own funds to the investments in public assets and the costs for the principals by investment loans is a positive number to the amount of 1,467 k BGN (line 6.2. from Report No 10) due to the following circumstances.

- In 2018 there is significant increase in the planned investments compared to the rest of the years by about BGN 2 M, due to the planned events for overhaul and rehabilitation of the digesters at SWWTP Kubratovo. Also as result of the analysis and priority setting of the investment projects in view of the technological needs and the achievement of the quality levels of the supplied services - in general the investments over the period 2017-2020 are higher. The commissioning of these assets over the period 2017-2021 leads to understandable increase in the costs for depreciation of public assets, constructed by own funds, but this increase over the years 2018-2021 varies between 182 k BGN and only 29 k BGN in 2021. In general these changes do not contradict the Ordinance on regulation of the prices of the water supply and sewerage services and the Instructions to them
- At the end of 2020 stops also the payment of the principals of the investments loan from the EBRD, which leads to reduction of the cost for payment of principals in 2021 by 1,657 k BGN for the wastewater treatment services compared to the preceding 2020.
- Despite the fact that as per line 8 from Report No 10 for 2021 there is arithmetic surplus of own funds, in the same year the company uses 0%

depreciation of the off-balance sheet assets and at the same time over the years 2017-2018 even at 100% participation of depreciations of the off-balance sheet assets the company operates with a deficiency of own funds, and the total deficiency over the years 2017-2019 exceeds - 4.6 M BGN for wastewater treatment activity.

In view of the circumstances above, but mostly in view of the analysis of the technological need for investments and capital events we think that the correcting of the investment profile would pose a risk on the meeting of the technological need in SWWTP Kubratovo. In general, it is in favor of the customers of WSS services to keep the investment profile proposed by the company.

2.4 INVESTMENTS WITH BORROWED FUNDS IN PUBLIC ASSETS

In view of the big share of the existing borrowed funds, the investment in public assets with borrowed funds for Business Plan 2017 - 2021 have not been provided.

3. DEPRECIATION PLAN

The depreciation plan of the fixed assets of the operator has been prepared in line with the Instructions on the price formation for the WSS services and in conformity with the discussed principles at the conducted trainings and working meetings with representatives of the EWRC.

For the purposes of the development of BP 2017 - 2021 the requirements of §4 from the Transitional and Final Provisions of the Ordinance on the prices have been observed as the accumulated depreciation as at 31.12.2015 are recalculated in conformity with the depreciation rates determined in Chapter Three, Section II, item 22 of the Instruction on the formation of the prices of WSS services, as in contrast with the rules of the uniform accounting system, according to which for the assets prior to 31.12.2005 different depreciation rates were applied from the ones for the assets after 01.01.2006 – in this business plan uniform depreciation rates have been applied.

In the Fixed assets the allocation is per services and systems depending on the activity, in which they are used. For the assets, used for supporting and administrative activities, as well as for assets used for the water supply service, the following allocation coefficients are applied:

Fixed assets (Needed for operational activities)	Ratio
Assets for administrative activities	
• **Non-regulated business**	4.30
• **WS Non-potable**	3.12
• **WS Bozhurishte**	0.02
• **WS Sofia -Supply**	68.74
• **WS Sofia – Sewerage**	6.35

• **WS Sofia – Treatment**	17.47
Water supply - own assets	
• **WS Non-potable**	4.34
• **WS Bozhurishte**	0.03
Water supply - public asset supply	
• **WS Sofia –Supply**	95.63
• **WS Bozhurishte**	0.03
WS Beli Iskar – own and public assets	
• **WS Sofia –Supply**	80.48
• **WS Beli Iskar**	19.52
General unrelated to non- regulated business	
• **WS Bozhurishte**	0.02
• **WS Sofia -Supply**	75.06
• **WS Sofia – Sewerage**	6.66
• **WS Sofia – Treatment**	18.26
• **Nonregulated activities**	4.30
General related to non- regulated business	
• **WS Non-potable**	3.12
• **WS Bozhurishte**	0.02
• **WS Sofia –Supply**	68.74
• **WS Sofia – Sewerage**	6.35
• **WS Sofia – Treatment**	17.47

For the fixed assets for WS Beli Iskar the applied allocation is based on the proportionate share of the volumes supplied to the main system of the WSS operator (for the service water supply to customers), and to the service water supplied to another WSS operator.

WS Beli Iskar – own and public assets	**Ratio**
• **WS Sofia -Supply**	80.48
• **WS Beli Iskar**	19.52

For each WS system of the operator an individual report has been prepared for depreciation plan of the fixed assets, as after filling in the data for the accumulated and annual depreciation for 2015, for the newly commissioned assets in 2015 and the values of the assets, which in the years will stop bringing depreciation, the new electronic models for BP 2017 - 2021 calculate the annual and accumulated depreciation automatically based on the entered book values, investment program and set depreciation rates. The book values of the fixed assets, included in the depreciation plan, are equal to the book values in the AFS as at 31.12.2015, in line with the Appendix ‘Reconciliation of book value of assets 2015’.

3.1 DEPRECIATION PLAN OF THE OWN FIXED ASSETS OF THE WSS OPERATOR

The depreciation plan of the own fixed assets has been prepared in line with the instructions, with recalculated annual depreciation and carrying amounts of the assets as at 31.12.2015 with the legally determined depreciation rates. The costs for annual depreciation of the existing assets for the period 2016 -2021 are adjusted through the Report 'New assets reporting year', in which the assets with upcoming full depreciation are reported. The assets with upcoming commissioning are included in the depreciation plan in line with the investment program of the WSS operator. The own fixed assets for 2015, allocated per services and systems are as follows:

Total own assets	Supply	Sewerage	Treatment	WS non-potable	WS Beli Iskar	WS Bozhurishte
Book value	59 943	14 214	14 116	1 099	5	15
Annual depreciation	2 305	490	603	81	1	1
Accumulated depreciation	40 274	7 318	9 125	622	1	11
Carrying amount	19 669	6 896	4 991	477	4	4

In connection with the question stated in it. 10.4 from the protocol of the conducted discussion and in particular - the requirement to submit an updated list of the corporate fixed assets with carrying amount, stated in the business plan, the information is presented in **Appendix "Corporate Assets**".

3.2 DEPRECIATION PLAN OF THE PUBLIC FIXED ASSETS, WHICH WILL BE CONSTRUCTED WITH FUNDS OF THE WSS OPERATOR FOR THE PERIOD OF THE BUSINESS PLAN

The depreciation plan of the public fixed assets, constructed with the funds of the WSS operator, has been prepared in line with the instructions, with recalculated annual depreciation and carrying amounts of the assets as at 31.12.2015, with the application fo the regulatory depreciation rates. For adjustment of the annual costs fro depreciation in Report 11.2 'New assets reporting year', the assets with upcoming full depreciation are reported. The assets with upcoming commissioning are included in the depreciation plan in conformity with the investment program of the WSS operator.

The public fixed assets constructed with own funds, allocated per services and systems, are as follows:

Public assets built with own funds	Supply	Sewerage	Treatment	WS non-potable	WS Beli Iskar	WS Bozhurishte
Book value	266 264	96 576	32 141	952	2 765	79
Annual depreciation	8 174	2 543	1 262	69	56	2

accumulated depreciation	55 988	14 573	7 197	493	713	16
Carrying amount	210 276	82 003	24 944	458	2 053	63

From the value of the public assets, constructed with own funds as at 2015 the sections are excluded from the water and sewer network, which are 2-10 m long at the amount of 11,165 k BGN, and assets constructed as per the Settlement Agreement with the MoS at the amount of 2,500 k BGN.
Further information is provided in the Appendix 'Reconciliation of book value of assets 2015'.

In connection with the question stated in it. 10.1 During the conducted discussion, we provide the following clarifications:

Regarding assets with expiring service life from group *Equipment*

The assets from group Equipment are part of the Public Assets, constructed by own funds. In SV the earliest date of acquisition of assets from this group follows the date of signing of the Concession Agreement. The service life of the public assets, constructed by own funds starts after October 2000.

On the other hand to group Equipment refer assets with long service life (25 and 50 years). By applying the regulatory depreciation rates for the relevant categories, the assets acquired over the period 2000-2015 they will not reach their full depreciation in the period of BP 2017-2021 and respectively it will not be necessary to include them in Report 11.2.

In the table below is shown how the carrying amount of the assets as at the end of 2021 changes, by applying the regulatory deprecation rates (*Note*: in the table below facilities were not referred to WS Non-potable, as the constructed ones under the Concession Agreement with the MoS are excluded from the Regulatory Assets Base):

№	Account	Year of depreciation	Description	Book value as at 31.12.2015					
				WS Sofia			WS Non-potable Water supply	BS Beli Iskar Water supply	WS Bozhurishte Water supply
				Supply	Sewerage	Treatment			
4	**204**		**Facilities**						
	20401		El. facilities						
	204010 1	*10%*	*Transformer*						
	204010 2	*4%*	*Power line*						
	20402		WSS facilities						
	204020 1	2%	*Dams*	10 797.65				2 618.91	
	204020 2	2%	*Water bodies and water catchments*	612.05				6.17	
	204020	2%	*Catchment points*	0.00				0.00	

	3								
	2040204	2%	*Drill and shaft wells*	0.00				0.00	
	2040205	2%	*Water mains incl. WSC*	187 184.33				77.95	58.34
	2040206	2%	*Sewerage incl. SSC*	104.43	84 949.44			0.00	
	2040207	4%	*Facilities in treatment, pumping, chlorination stations and reservoirs*	17 094.59		31 253.20		10.94	5.12
	2040208	4%	*Other WSS facilities*	0.00					
	20403	4%	Other facilities-own assets	0.00					
	20403-	4%	Other facilities - public assets, constructed with own funds	655.25	26.14	309.15		15.01	0.17

№	Account	Year of depreciation	Description	Carrying value as at 31.12.2015					
				WS Sofia			WS Non-potable	BS Beli Iskar	WS Bozhurishte
				Supply	Sewerage	Treatment	Water supply	Water supply	Water supply
4	**204**		**Facilities**						
	20401		El. facilities						
	2040101	*10%*	*Transformer*						
	2040102	*4%*	*Power line*						
	20402		WSS facilities						
	2040201	2%	*Dams*	8 119.12				1 969.25	0.00
	2040202	2%	*Water bodies and water catchments*	497.15				4.53	0.14
	2040203	2%	*Catchment points*						0.00
	2040204	2%	*Drill and shaft wells*						0.00
	2040205	2%	*Water mains incl. WSC*	163 651.87				57.97	51.10
	2040206	2%	*Sewerage incl. SSC*	98.03	77 484.23				0.03
	2040207	4%	*Facilities in treatment, pumping, chlorination stations and reservoirs*	13 772.01		24 348.79		8.18	4.12
	2040208	4%	*Other WSS facilities*						0.00
	20403	4%	Other facilities-own assets						
	20403-	4%	Other facilities - public assets, constructed with own funds	325.12	12.62	214.82		10.51	0.08

№	Account	Year of depreciation	Description	Sum of the annual depreciations over the period 2016 -2021 (i.e. accumulated new depreciation for a period of 6 years at book values as at 31.12.2015)					
				WS Sofia			WS Non-potable	BWS Beli Iskar	WS Bozhurishte
				Water supply	Sewerage	Treatment	Water supply	Water supply	Water supply
4	**204**		**Facilities**						
	20401		El. facilities						
	2040101	*10%*	*Transformer*						
	2040102	*4%*	*Power line*						
	20402		WSS facilities						
	2040201	2%	*Dams*	1 295.72				314.27	0.00
	2040202	2%	*Water bodies and water catchments*	73.45				0.74	0.00
	2040203	2%	*Catchment points*	0.00				0.00	0.00
	2040204	2%	*Drill and shaft wells*	0.00				0.00	0.00
	2040205	2%	*Water mains incl. WSC*	22 462.12				9.35	7.00
	2040206	2%	*Sewerage incl. SSC*	12.53	10 193.93			0.00	0.00
	2040207	4%	*Facilities in treatment, pumping, chlorination stations and reservoirs*	4 102.70		7 500.77		2.62	1.23
	2040208	4%	*Other WSS facilities*						
	20403	4%	Other facilities-own assets						
	20403-	4%	Other facilities – public assets, constructed with own funds	157.26	6.27	74.20		3.60	0.04

№	Account	Year of depreciation	Description	Carrying amount of facilities as at 31.12.2021					
				WS Sofia			WS Non-potable	BWS Beli Iskar	WS Bozhurishte
				Water supply	Sewerage	Treatment	Water supply	Water supply	Water supply
4	**204**		**Facilities**						
	20401		El. facilities						
	2040101	*10%*	*Transformer*						
	2040102	*4%*	*Power line*						
	20402		WSS facilities						
	2040201	2%	*Dams*	6 823.40				1 654.98	

	2040202	2%	*Water bodies and water catchments*	423.71				3.79	0.14
	2040203	2%	*Catchment points*						
	2040204	2%	*Drill and shaft wells*						
	2040205	2%	*Water mains incl. WSC*	141 189.75				48.61	44.10
	2040206	2%	*Sewerage incl. SSC*	85.49	67 290.30				0.03
	2040207	4%	*Facilities in treatment, pumping, chlorination stations and reservoirs*	9 669.30		16 848.02		5.55	2.89
	2040208	4%	*Other WSS facilities*						
	20403	4%	Other facilities-own assets						
	20403-	4%	Other facilities – public assets, constructed with own funds	167.86	6.35	140.63		6.91	0.04

Regarding the matter as per it. 10.2 from the protocol about the conducted discussion on 11.11.2016 regarding reconciliation of the newly-acquired fixed assets with the annual financial statement (AFS) for 2015 – the information is provided in detail in **Appendix "Reconciliation of the newly-acquired assets.**

3.3 DEPRECIATION PLAN OF THE PUBLIC FIXED ASSETS, PROVIDED TO THE WSS OPERATOR WITH A CONTRACT FOR OPERATION AND MAINTENANCE

The depreciation plan of the public fixed assets, provided for operation and maintenance has been prepared as per the data from the accounting system. The assets are allocated per services in the WS Sofia. When calculating the annual depreciation quotas, the regulatory determined depreciation rates are applied. The assets are taken into account with upcoming full depreciation.

With a letter to the MoS information was requested for the assets, which would be provided for operation from the MoS in the period of the BP 2017 - 2021. With the letter from the MoS ref. COA 16-ТД26-1609(5)/03.06.2016, SV was informed that to date no information could be provided for specific projects.

Due to the lack of specific information in the years 2017 - 2021 no values are entered for new public assets, which will be transferred to the Company for operation and maintenance, excluding 2016, in which values of new public assets are entered once in Report №11.2 for WS Sofia based on actually accounted off balance sheet assets for the period January – October 2016 as per ***Appendix Accounted off-***

balance sheet assets for the period January – October 2016 and in line with the table below:

Service	Value actually been listed off-balance sheet assets for the period January-October 2016 (thousand BGN)
Supply	3 653
Sewerage	1 860
Treatement	0
Total	5 513

Nevertheless, the generated depreciation of the off balance sheet assets in line with Report No.10 does not cover the shortage of own resources and in line with row 8 of Report No.10, this shortage is existing in each of the years and for each service excluding the activity for wastewater treatment for 2020 and 2021 as in 2021 the depreciation taken from the off balance sheet assets in Report No.12 is equal to zero.

Regarding item 9.1 of the Protocol for the discussion held on 11.11.2016, we provide the following additional information with regard to the lists of assets requested by the EWRC – public municipal property:

1. The Concession Agreement (CA) was signed on 23.12.1999 between the Municipality of Sofia (MOS) and Sofiyska Voda (SV). As per the definitions given in it, the existing public assets are the public assets which are within the categories of assets specified in the list of assets indicated in Annex 2 to the CA.
2. At the same time, it is agreed in the Agreement that it becomes effective within a certain period of time after the receipt by each of the parties of written notifications for their satisfying (or derogation) of the conditions precedent set out in art.3.
3. Among these conditions precedent (art.3.1.17) is also the achieved agreement between the parties for the public assets falling in the categories of assets specified in the list of assets. In compliance with the specified condition precedent, on 05.10.2000 a Bilateral protocol was signed by the parties to the CA, and it is stipulated under item 3 of it that within 36 months of the entry in force of the CA, the concessionaire will provide a further list of identified public assets, which will be included in the list of assets specified in Annex 2 to the CA.
4. In compliance with this obligation, in October 2003 the concessionaire submitted to the Grantor an Asset Register, in which all existing public assets were specified and described in detail, as handed over by the Grantor to the concessionaire to be used and operated in relation to the CA.
5. The fact that the mentioned above Asset Register contains detailed description of all existing public assets, handed over by the Grantor to the

concessionaire, was found in the Second Amendment Agreement to the CA, signed in 2008, and under it the art.10.3.1 of the CA is amended with the following wording: "10.3.1 amended (SAA) – "The Grantor has handed over the Existing Public Assets as listed in Annex 2 to the Concessionaire for use and operation in relation to the Project. The Existing Public Assets set out in the Assets List are specified and described in detail in the Asset Register prepared by the Concessionaire and submitted to the Grantor in October 2003"

6. The public assets handed over by the Grantor to the concessionaire are accounted as off-balance sheet assets in the accounting system of the Company. The values of the assets handed over as at 31.12.2003 can be seen from the inventory lists enclosed with the business plan.

It can be seen from the above that the list of the assets – public municipal ownership, operated and maintained by Sofiyska Voda, is defined and it is part of the CA, and it is contained in the provided Asset Register from 2003.

In order to support the above, Sofiyska Voda sends the following (contained in e-format in the folder Appendix Off-balance sheet assets): 1) Bilateral protocol signed by the parties to the CA dated 05.10.2000; 2) Second Amendment Agreement to the CA; 3) Annex 2 to the CA; 4) Asset Register from 2003 ; 5) Inventory lists from the accounting system as at 31.12.2003 of the off-balance sheet public assets and trial balances from the accounting system as at the same date.

Regarding item 9.2 of the Protocol for the discussion held on 11.11.2016, we provide the following additional information:

With the letter your ref.B-07-00-28/26.07.2016 (our ref. CB-1677/25.07.2016) the Company provided information about the public assets in Section III of the depreciation plan with total book value of 514,634 k BGN (below "off-balance sheet assets"), and the information contains:

- Summary of the book values of each of the accounting bases, which form the total of the off-balance sheet assets

Databases in AJUR-L accounting system for off-balance sheet assets	Book values as at 31.12.2015 (in k BGN)
POS	361 258
POS – Iskar water main	115 591
POS – Bistritsa	30 965
POS – Second pressure pipe	6 821
Total	**514 634**

- Detailed lists for each asset in electronic format, as follows: 4 files in pdf for each of the four bases – ПОС, ISKAR, BISTRITSA, Second Pressure pipe (Nitka)

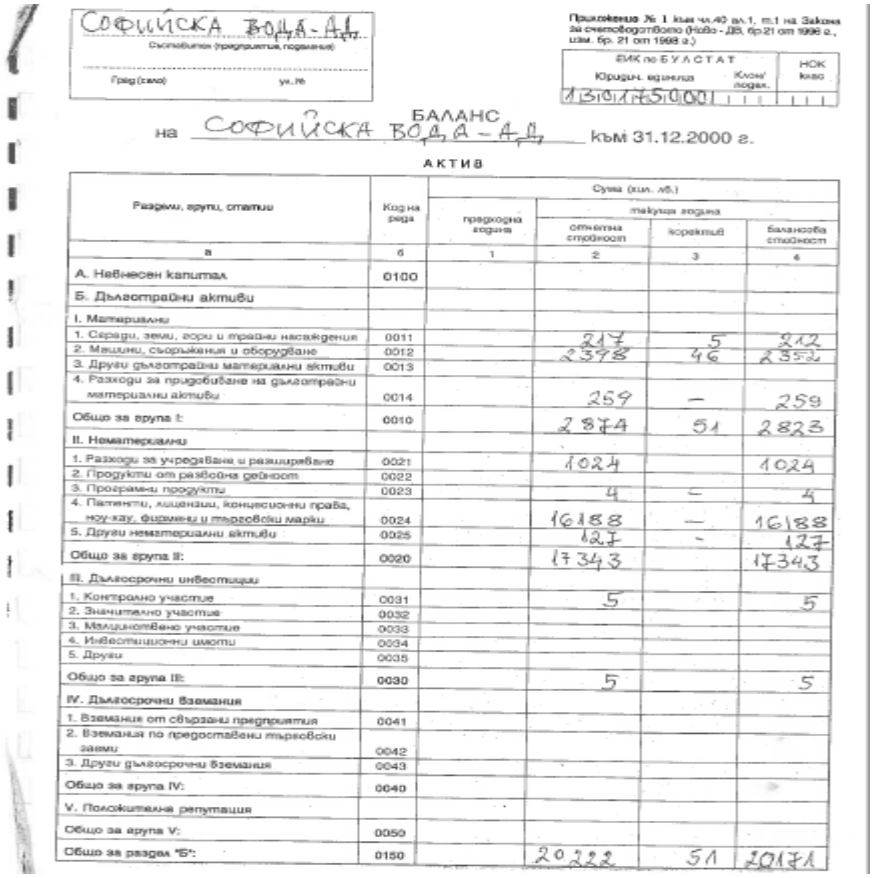
- Other clarifications

In the same letter /your ref.B-07-00-28/26.07.2016 (our ref. CB-1677/25.07.2016)/ the Company indicates reconciliation of the book values in sections *Own fixed assets* (Group I in the report) and *Public fixed assets* (Group II in the report), in the way they are filled in **Report No.11 Depreciation Plan of Fixed Assets** with the AFS certified by an independent auditor for 2015:

	Assets included in the RAB in BP 2017-2021						**Assets excluded from the RAB and the electronic model for BP 2017-2021**				
Total assets: Own and public assets, constructed with own funds	**Water supply**	**Sewerage**	**Treatment**	**WS Non-potable**	**BWS Beli Iskar**	**WS Bozhurishte**	**Sections water main and sewer 2-10 m**	**Assets, constructed under an agreement with MoS**	**Goodwill**	**Non-regulated business**	**Total book values as at 31.12.2015**
Own assets	59 943	14 214	14 116	1 099	5	15				7 233	96 625
Public assets (concession right)	266 264	96 576	32 141	952	2 765	79	11 165	2 500	7 393		419 836
Total sum of the assets	**326 208**	**110 790**	**46 257**	**2 050**	**2 771**	**94**	**11 165**	**2 500**	**7 393**	**7 233**	**516 461**
Total assets as per the AFS as at 31.12.2015, including assets in process of construction (in k BGN)											**516 463**

The total sum of the assets from sections I and II is of the assets constructed with the resources of the Company. This sum is close to the sum of the book values in Section III from report No.11, but there is no asset duplication. The assets in sections I and II, which correspond to the values in the company balance sheet, are constructed and accounted as a result of costs incurred by the company - unlike the assets in section III, which are constructed as a result of costs incurred by third parties (private investors or the Municipality of Sofia). These assets are not accounted in the intangible asset Concession right in the balance sheet of the company.

When signing the CA and starting its activity, the Company had zero book value of the assets in the balance sheet, i.e. from the start of its activity the Company does not account and enter in its balance sheet public assets already constructed by ViK and MoS (conduits, treatment plants, facilities and many other assets with high book value):



СОФИЙСКА ВОДА - АД

Приложение № 1 към чл.40 ал.1, т.1 на Закона за счетоводството (Нова - ДВ, бр.21 от 1998 г., изм. бр. 21 от 1998 г.)

ЕИК по БУЛСТАТ

Юридич. единица	Клон/ подраз.	НСК код
121017650001		

БАЛАНС

на СОФИЙСКА ВОДА - АД към 31.12.2000 г.

АКТИВ

Раздели, групи, статии	Код на реда	Сума (хил. лв.)			
		предходна година	текуща година		
			отчетна стойност	коректив	балансова стойност
а	б	1	2	3	4
А. Невнесен капитал	0100				
Б. Дълготрайни активи					
I. Материални					
1. Сгради, земи, гори и трайни насаждения	0011		217	5	212
2. Машини, съоръжения и оборудване	0012		2398	46	2352
3. Други дълготрайни материални активи	0013				
4. Разходи за придобиване на дълготрайни материални активи	0014		259	—	259
Общо за група I:	0010		2874	51	2823
II. Нематериални					
1. Разходи за учредяване и разширяване	0021		1024		1024
2. Продукти от развойна дейност	0022				
3. Програмни продукти	0023		4	—	4
4. Патенти, лицензии, концесионни права, ноу-хау, фирмени и търговски марки	0024		16188	—	16188
5. Други нематериални активи	0025		127	-	127
Общо за група II:	0020		17343		17343
III. Дългосрочни инвестиции					
1. Контролно участие	0031		5		5
2. Значително участие	0032				
3. Малцинствено участие	0033				
4. Инвестиционни имоти	0034				
5. Други	0035				
Общо за група III:	0030		5		5
IV. Дългосрочни вземания					
1. Вземания от свързани предприятия	0041				
2. Вземания по предоставени търговски заеми	0042				
3. Други дългосрочни вземания	0043				
Общо за група IV:	0040				
V. Положителна репутация					
Общо за група V:	0050				
Общо за раздел "Б":	0150		20222	51	20171

The values of the own assets in every annual statements increase after the accounting of the assets as a result of costs incurred by the Company for the acquisition of the fixed assets, as the company started its activity in 2000.

It should be noted that the book value of the public assets which are in the off-balance sheet of Sofiyska Voda is 281,026,516.32 BGN as at the end of 2003 (when the public assets were finally settled between the Grantor and the concessionaire) and reached 514,634,476.95 BGN as at the end of 2015, and this is the amount of the *Public fixed assets, handed over to the operator for operation and maintenance,* given in Report 11 to the business plan. The amount of the public assets as at 2003 can be also seen from the trial balances for 2003, taken out of the accounting system of the Company and enclosed with the business plan. The fluctuation in the value of the public assets for the period 2003 – 2015 can also be seen in the provided report.

At the meetings held on 11.11.2016 and 22.12.2016, an opinion was stated by the EWRC that SV should revise in the price model the costs for depreciation of the public assets from Group 3 (off-balance sheet assets).

The fact should be taken into account that in the draft BP 2017 – 2021, submitted on 30.06.2016, SV included 100% depreciation of the off-balance sheet assets due to following reasons:

- The inclusion of this cost element in the price of the WSS services is a possibility envisaged in the Ordinance on the regulation of the prices of the WSS services and it is valid both for all WSS operators and SV;

- We believe that the depreciation allowances for these assets should be included as a cost element in the price of the WSS services because the Company is obliged to maintain these assets in good operational condition. In addition, a main principle of the price formation and a EU requirement is the full cost recovery, and due to that these costs should be reflected and reimbursed through the price of the WSS services;
- The Company has set 100% use of these off-balance sheet depreciation due to the fact that even its forecast amount for the period 2017-2021 is insufficient to cover the planned investments and costs related to servicing the loans of the Company. Covering this financing gap through the cash flows generated from the average weighted return on the capital of the Company in practice decreases the actual return on equity not only below the level set in the Concession Agreement but also below the level set by the EWRC.

In view of the fact that the amount of depreciation allowances of off-balance sheet assets is one of the main issues related to the Business Plan 2017-2021, as well as the fact that this element has considerable impact on the price of WSS services, and in order not to jeopardize and delay the process of the timely review and approval of Business Plan 2017-2021, Sofiyska Voda AD carried out additional analyses in regard to the requirement of EWRC that the amount of the depreciation allowances of off-balance sheet assets should be revised.

Taking into account all the previously stated facts, the company is applying 20% depreciation allowances of off-balance sheet assets in the version of Business Plan 2017-2021.

The effect of that decision will be an expected decrease in the initially proposed levels of WSS services by around BGN 0.12-0.15 m3/year for the period of the Business Plan. Respectively, the cash flows generated by the Company will be ostensibly decreased, as this will have a direct impact on the possibility for the Company to be flexible in making investments, different from those set in its 5-year investment program.

Moreover, according to the Ordinance of prices, EWRC may allow gradual inclusion of depreciation deductions on the assets – public state and/or municipal property depending on the financial condition of the WSS operator and its capability to fund the investment program. That is why, SV keeps its right to request the

including of these costs in the price of the WSS services in case that the financial and economic condition of the company become worse or additional investment commitment not foreseen at present arise.

After the additional meeting with the EWRC held on 22.12.2016, the company prepared corrected electronic models, in which the amount of the annual costs for depreciations of the off-balance sheet public assets is reduced to 20% from the calculated depreciations of the off-balance sheet public assets for each of the years over the period 2017-2021 – which is 80% decrease of the costs for depreciations of the off-balance sheet assets compared to the electronic models of the Business Plan revised in November 2016.

As seen from **Report № 10 Invetsments and sources of planning** row7.3.:

7.3.	Share of depreciation expenses of public assets, granted for operation and maintenance, included in prices

share of the costs for depreciation of the off-balance sheet assets is 20% for the three services – except for wastewater treatment in 2021, in which the share of depreciation is e 0%.

As a result of the reduction of the depreciation of off-balnce sheet assets in the annual eligible costs, the complex price for domestic and equal to them customers decreased compared to the complex price in the price application from November 2016 average with -0.15 BGN/m^3 for each of the years 2017-2021.

4. COSTS ANALYSIS

When developing BP 2017 - 2021 the requirements of §4(2) from the Transitional and Final Provisions of the Ordinance on the prices have been observed as the data for the costs, with the exception of the costs for depreciation of the fixed assets, are specified in line with the uniform accounting system.

The tables below show the reconciliation of the costs per economic items (without depreciation) with the reported annual costs in the form of the price models in line with the report on the activity for 2015 (**Appendix 'Costs in the form of the price models'**) and the costs in the new price models for BP 2017 - 2021. In the tables below the costs without depreciation are compared since in the models for the BP 2017 - 2021 the costs for depreciation are recalculated in conformity with **the Ordinance on the prices and the Instructions on the formation of the prices of WSS services through the price cap method for the regulatory period 2017 - 2021** (Instructions on the prices) and there could be no reconciliation between the depreciation costs. The reconciliation is presented on a common base as well –

common cost for the respective service or water system due to the different way of presenting the costs for repair – in the models for the BP 2017 - 2021 the costs for repair are specified in the respective categories for materials, hired services, remunerations and social contributions, etc.

Also the provisions of art.15 of the **Instructions on the price formation through the price cap method for the regulatory period 2017 - 2021** (Instructions on the prices) have been observed, according to which the costs and return on capital from the WS Beli Iskar are added to the WS Sofia in proportion to the respective volumes. In particular, the relevant costs from WS Beli Iskar to WS Sofia have been added in the column 2015 per respective cost items, and the relevant share of the assets and investments are added to the book value of the assets and investments for WS Sofia as in this way the proportional allocation of the return is ensured as well after multiplying the regulatory asset base with the rate of return.

In this version of the BP 2017-2021 the corrections are given versus the initially submitted BP in line with the replies of the company to the letter from the EWRC, No.B-17-44-25/18.08.2016, and in particular, in line with the replies under items 10 and 12 of the letter. Also, the correction in the present version is reflected as a result from the public discussion held on 11.11.2016 and the relevant protocol.

In summary, the corrections made to the business plan initially submitted in June 2016:

Costs by economic elements	Variation in the costs total for all WS and activities						
	2015	2016	2017	2018	2019	2020	2021
Before corrections – Initially field Business Plan	91 205,05	95 091,81	100 572,81	101 850,17	104 150,23	105 263,11	107 066,54
After corrections, described in response to letter of EWRC No B-17-44-25	91 205,05	95 091,81	100 518,84	101 799,88	103 968,36	104 610,08	105 896,67
Variation in the forecasted costs			-53,97	-50,29	-181,87	-653,03	-1 169,87
Costs NEC Yazoviri I Kaskadi			188,69	188,69	188,69	188,69	188,69
Decrease in Licenses as per justification *Reduction*			-79,14	-79,14	-79,14	-79,14	-79,14
Increase in licenses for new Customer accounts as per a justification			22,10	25,78	29,46	33,15	35,91
Financial audit			-41,00	-41,00	-41,00	-41,00	-41,00
Costs for past periods			-144,62	-144,62	-144,62	-144,62	-144,62
Depreciations of off-balance assets			0,00	0,00	-135,26	-610,11	-1 129,71
Total variation			**-53,97**	**-50,29**	**-181,87**	**-653,03**	**-1 169,88**
Inspection			0,00	0,00	0,00	0,00	0,00

]

Revised BP – November 2016							
Revised costs – Total	91 205,05	94 382,37	96 765,01	97 698,83	99 497,00	99 903,96	100 606,54
Variation of the forecasted costs: revised BP November 2016 compared to the costs in a response to a letter of EWRC No B-17-44-25	**0,00**	**-709,44**	**-3 753,82**	**-4 101,05**	**-4 471,36**	**-4 706,12**	**-5 290,13**
Correction of costs for advertising services - referred to Unrecognized costs as per it. 13.4 from a protocol from conducted discussion		0,00	-17,78	-17,78	-17,78	-17,78	-17,78
Variance of materials for disinfection as result of changed water volumes (billed and at inlet)		0,00	0,17	8,27	8,21	8,07	8,01
Variance of the costs for coagulants as result of changed water volumes (billed and at inlet)		0,00	0,24	11,14	10,91	10,58	10,36
Variance of the fee for regulation, as result of changed billed water volumes		0,00	0,00	0,00	14,63	15,45	15,86
Variance of the fee for water abstraction		0,00	2,29	111,14	110,30	108,48	107,66
Variance of the fee for discharge, as result of changed billed water volumes		0,00	0,00	14,63	15,45	15,86	65,87
Variance of costs for salaries		0,00	-2 501,37	-2 910,86	-3 338,68	-3 802,04	-4 292,19
Variance of costs for social expenses		0,00	-471,52	-550,44	-661,49	-787,76	-946,89

in hired service - communication service – additional classification of CAPEX until 2016 compared to operations after 2017 from hydraulic model, PMA and DMA programs		0,00	27,96	27,96	27,96	27,96	27,96
Corrections in hired services - repair		0,00	-88,16	-89,47	-70,49	-60,73	-45,14
Variance of the materials, work clothes – additional classification of CAPEX until 2016 compared to operations after 2017 from hydraulic model PMA and DMA programs		0,00	3,79	3,79	3,79	3,79	3,79
Reduction in the annual depreciations from new off-balance sheet assets due to use of the value of the registered off-balance sheet assets from January – October 2016 instead of average annual value 2011-2015		-709,44	-709,44	-709,44	-574,18	-228,01	-227,64
Correction in the costs for WS Bozhurishte due to change in the volumes at inlet		0,00	0,00	0,00	0,00	0,00	0,00
Total variance		**-709,44**	**-3 753,82**	**-4 101,05**	**-4 471,36**	**-4 706,12**	**-5 290,13**
Inspection		0,00	0,00	0,00	0,00	0,00	0,00
Total variance of the costs compared to the initially filed BP		**-709,44**	**-3 807,80**	**-4 151,34**	**-4 653,23**	**-5 359,15**	**-6 460,00**

As a result of additional conversation with EWRC on 22.12.2016 in the electronic models additional corrections are made compared to the Revised Business plan from November 2016 which lead to to a significant reduction in the estimated annual Reductions are as follows:

Costs by economic elements (K BGN)	Variation in the costs total for all WS and activities						
	2015	2016	2017	2018	2019	2020	2021
Total variance of the costs compared to the initially filed BP (K BGN)	0,00	0,00	-11 738,22	-11 760,67	-11 773,95	-11 480,19	-10 354,61-
Variance of the revised Business plan from December 2016 compared to the Revised Business plan from November 2016 conist of :							
Variance of the costs for depreciation of off-balance sheet assets	0,00	0,00	-10 745,29	-10 745,29	-10 745,29	-10 439,25-	-9 297,34
Variance of the costs for remunerations and social insurance contributions in the revised BP in December 2016	0,00	0,00	-992,92	-1 015,38	-1 028,65	-1 040,94	-1 057,27

Table below summarizes the significant reduction in the estimated costs compared to the initially submitted Business Plan in June 2016:

Revised BP – December 2016							
Costs by economic elements	Variation in the costs total for all WS and activities						

	2015	2016	2017	2018	2019	2020	2021
Total variance of the costs in the Revised Business Plan November 2016 compared to initially filed Business plan in June 2016 (KBGN)		**-709,44**	**-3 807,80**	**-4 151,34**	**-4 653,23**	**-5 359,15**	**-6 460,00**
Total variance of the costs compared to Revised Business plan November 2016 (KBGN)	**0,00**	**0,00**	**-11 738,22**	**-11 760,67**	**-11 773,95**	**-11 480,19**	**-10 354,61**
Total variance of the costs compared to the initially filed BP (K BGN)	**0,00**	**-709,44**	**-15 546,01**	**-15 912,02**	**-16 427,17**	**-16 839,34**	**-16 814,61**

Detailed breakdown of the changes stated above is presented by types of services and water system in **Appendix "Corrections of the forecasted expenses".** The total correction in the costs compared to the initially filed BP is towards reduction from - 15 546 k BGN in 2017 to - 16 814 k BGN in 2021

In addition as part of the response as per it. 12.1.12 to letter of the EWRC No B-17-44-25/18.08.2016 the company provides additionally **Appendix 5: Report – justification of the forecasted future costs for new sites and / or activities** in accordance with the requirements which we enclose again.

The provisions of art. 15 of the **Instructions for formation of the prices of the water supply and sewerage services using the *price cap* method for the regulatory period 2017-2021** (Instructions on prices) are met. In accordance with them the costs and

rate of return on capital from the separated system WS Beli Iskar are added to WS Sofia proportionally to the relevant volumes. In particular, the costs, which are referable from WS Beli Iskar to WS Sofia, are added in column 2015 by the relevant costs elements and the referable share of the assets and the investments are added to the carrying amount of the assets and investment for WS Sofia, thus ensuring proportional distribution and rate of return after multiplication of the RAB by the rate of return.

№	Costs by economic item	Expenses for 2015 in the form of pricing models (k BGN) Supply Report to date 31.12.2015	Sewerage Report to date 31.12.2015	Treatment Report to date 31.12.2015	Non-regulated Report to date 31.12.2015		№	Costs by economic item	(k BGN) WS Beli Iskar Report to date 31.12.2015	WS Bozhurishte Report to date 31.12.2015	WS non-potable Report to date 31.12.2015	Total costs incl. all WS, incl. Non-regulated business Report to date 31.12.2015
1	Costs for materials	2 598	131	3 801	498		1	Costs for materials	18,89	0,73	81,87	7 129,11
2	Costs for external services	18 733	744	3 083	601		2	Costs for hired services	1 058	6,81	1 187	25 413
4	Expenses, incl. salaries	9 316	534	2 909	921		4	Expenses, incl. salaries	313	2,61	437	14 433
5	Expenses, insurances incl.	2 287	123	750	236		5	Expenses, insurances incl.	99	0,64	108	3 605
6	Other expenses	1 327	78	401	58		6	Other expenses	152	0,19	38	2 056
7	Expenses for current and emergency repairs	*7 237*	*2 349*	*1 074*	*281*		7	Expenses for current and emergency repairs	*15,253*	*2,0239*	*273*	*11 231*
8	Total cost:	41 498	3 959	12 017	2 597				1 657,26	13,00	2 125,29	63 867
9	of which supply of WS Beli Iskar, according to previous price decision EWRC C-21/29.06.2012	2 592										
10	Total cost:	38 906	3 959	12 017	2 597				1 657	13	2 125	61 275

Regarding WS Beli Iskar the described above calculation of the distribution of the costs, the carrying amount of the assets and the investments between WS Sofia and WS Beli Iskar is based on the following data about water volumes:

Report models for Business Plans 2017-2021 - columns 2015 after allocation from WS Beli Iskar (k BGN)												(k BGN)
№	Costs by economic item	Supply Report to date 31.12.2015	sewage Report to date 31.12.2015	treatment Report to date 31.12.2015	Non-regulated Report to date 31.12.2015		№	Costs by economic item	WS Beli Iskar Report to date 31.12.2015	WS Bozhurishte Report to date 31.12.2015	WS Non-potable Report to date 31.12.2015	Total costs incl. all WS, incl. Non-regulated activity Report to date 31.12.2015 г.
1	Costs for materials	3 504	532	4 079	515		1	Costs for materials	3,97	0,98	115,02	8 750,11
2	Costs for hired services	18 247	1 468	2 860	861		2	Costs for external services	37	5,06	1 022	24 501
3	Expenses, incl. salaries	10 876	1 426	3 344	921		3	Expenses, incl. salaries	61	2,97	485	17 117
4	Expenses, insurances incl.	2 727	431	871	236		4	Expenses, insurances incl.	19	0,74	122	4 407
5	Other expenses	1 272	62	356	57		5	Other expenses	29,76	0,14	29	1 773
6	Taxes and Charges	*3 647*	*40*	*507*	*6*		6	Taxes and Charges	*172,742*	*3,11*	*353*	*4 728*
7	Total cost:	40 240	3 959	12 017	2 597		7		323,50	13,00	2 125,29	61 275

In terms of WS Beli Iskar the calculation for the allocation of costs, book value of the assets and investments between WS Sofia and WS Beli Iskar is based on the following data for the water volumes:

Description	Measure	2015	2016	2017	2018	2019	2020	2021
Water supply to customers								
Total volume of water at the inlet of the system A3/Q4	m^3/year	**8 633 851**	**8 616 159**	**9 237 818**	**9 348 769**	**9 042 769**	**8 886 769**	**8 730 769**
Raw water from surface water sources	m^3/year	44 247 516	46 000 000	46 000 000	46 000 000	46 000 000	46 000 000	46 000 000
Sold raw water to another water supply operator - in Sofia	m^3/year	35 613 665	37 383 841	36 762 182	36 651 231	36 957 231	37 113 231	37 269 231
Share for WS Sofia		80,49%	81,27%	79,92%	79,68%	80,34%	80,68%	81,02%
Share for WS Beli Iskar		19,51%	18,73%	20,08%	20,32%	19,66%	19,32%	18,98%
Arithmetical share of WS Sofia		80,48%						
Arithmetical share of WS Beli Iskar		19,52%						

In terms of the **costs for use of water bodies** the calculations and allocation of the cost between the different water systems has been prepared as follows:

Quantity m^3		2017	2018	2019	2020	2021
Abstracted raw water from surface water sources		46 114 403	51 556 894	51 514 956	51 423 940	51 383 131
Abstracted raw water from underground water sources		880 676	349 715	339 182	328 928	319 343
Supplied raw water from another water supply operator		116 167 289	105 700 394	101 131 211	96 683 239	92 525 445
	1	**163 162 367**	**157 607 004**	**152 985 349**	**148 436 107**	**144 227 919**
From which For WS Bozhurishte	*2*	148 588	145 531	145 531	145 531	145 531
Water quantities without WS Bozhurishte	*3*	163 013 780	157 461 473	152 839 818	148 290 576	144 082 388

Quantities WS Beli Iskar	*4*	46 000 000	46 000 000	46 000 000	46 000 000	46 000 000
Quantities returned from WS Beli Iskar to WS Sofia	*5*	36 762 182	36 651 231	36 957 231	37 113 231	37 269 231
Quantities at the inlet of WS Sofia	*6*	**153 775 962**	**148 112 704**	**143 797 049**	**139 403 807**	**135 351 619**
Quantities allocated to WS Beli Iskar - the difference between 4 and 6 above	*7*	9 237 818	9 348 769	9 042 769	8 886 769	8 730 769
Check (Total abstracted water)	*15*	**163 162 367**	**157 607 004**	**152 985 349**	**148 436 107**	**144 227 919**
Quantities for pricing model WS Sofia	m3	153 775 962	148 112 704	143 797 049	139 403 807	135 351 619
Water abstraction fee for price model for WS Sofia, at the rate BGN/m^3	0,02	3 075 519	2 962 254	2 875 941	2 788 076	2 707 032
Quantities for pricing model WS Beli Iskar		9 237 818	9 348 769	9 042 769	8 886 769	8 730 769
Water abstraction fee for price model for WS Beli Iskar, at the rate BGN/m3	0,02	184 756	186 975	180 855	177 735	174 615
Quantities for pricing model WS Bozhurishte	м^3	148 588	145 531	145 531	145 531	145 531
Water abstraction fee for price model for WS Bozhurishte, at the rate BGN/m3	0,02	2 972	2 911	2 911	2 911	2 911
Quantities for pricing model WS non-potable water	м^3	8 350 000	6 871 348	6 780 936	6 690 523	6 600 111
Water abstraction fee for price model for WS Bozhurishte, at the rate BGN/m3	0,045	375 750	309 211	305 142	301 074	297 005

The fee for regulation is allocated per activities and water systems as follows, and the calculations per years are presented in the **Appendix 'Calculation of the fee for regulation per years'**:

	WS Sofia						(k BGN)
	Supply	**Sewage**	**Treatment**	**Beli Iskar**	**Bozhurishte**	**Non potable**	**Total:**
Percentage of distribution AUS	*71,84%*	*6,65%*	*18,26%*	*0,00%*	*0,00%*	*3,26%*	*100,00%*
2017	281,91	26,09	71,65	0,00	0,00	12,78	**392,44**
2018	294,09	27,22	74,75	0,00	0,00	13,33	**409,39**
2019	292,41	27,06	74,32	0,00	0,00	13,26	**407,05**
2020	293,48	27,16	74,60	0,00	0,00	13,31	**408,54**

2021	293,61	27,17	74,63	0,00	0,00	13,31	**408,72**

Fee for **wastewater discharge** for the service wastewater treatment has been calculated as follows:

	2017	2018	2019	2020	2021
Volumes of m^3 billed water, according to Decree of Council of Ministers No.377/30.12.2011, art.12	81 477 641	81 010 233	81 308 627	81 343 877	81 434 012
rate (BGN m^3)	0,005	0,005	0,005	0,005	0,02
Cost	407 388	405 051	406 543	406 719	1 628 680

In connection with it. 13.3 from the Protocol about the discussion that was held we provide the following additional information - *regarding the discharge fee* in wastewater treatment activity in BP 2017-2021 for all fees for water abstraction (use of water bodies) and discharge are used the fees in the Decree of the Council of Minister (DCM) No 377 / 30.12.2011, SG 10.01.2012, copy 50 (enclosed electronically) – which amends in art. 12 the previous DCM 177/24.05.2011 (enclosed electronically). In DCM 377 it is stated:

Calculation as per Decree of the Council of Ministers No 377 /30.12.2011	**2017**	**2018**	**2019**	**2020**	**2021**
T = E x W	81 477 640,70	81 010 233,00	81 308 627,00	81 343 876,58	81 434 012,00
W - billed water volume, supplied by the operator to the customers m^3	0,005	0,005	0,005	0,005	0,020
T (Fee as per Decree of the Council of Ministers No 377 /30.12.2011)	**407 388,20**	**405 051,17**	**406 543,14**	**406 719,38**	**1 628 680,24**
Expenses in BGN					

Respectively the increase in the expense for 2021 is explained by the 5-time increase in the applied fee as per Decree of the Council of Ministers No 377.

In terms of the **costs for hired services** the main variations are as follows:

The costs for hired services are forecasted with prices under effective contracts as at the date of preparation of this BP. The following changes per cost items are provided for:

- In the costs for insurances an assumption has been made for a decrease of 244 k BGN, which is due to the following reasons:

    - Lower price under a contract for insurance services for the risks 'Property insurance'; insurances Liability to third persons and continuity of the activity'. In 2017 lower cost has been provided by 230 k BGN as compared to 2015, the decrease in the cost is allocated as follows:
        - WS Sofia Water supply - 138 k BGN
        - WS Sofia Sewerage - 14 k BGN
        - WS Sofia Wastewater treatment - 62 k BGN
        - WS Beli Iskar – 4 k BGN
        - WS Non-potable water 6 k BGN
        - Non-regulated business - 6 k BGN
    - Adjustment for decrease in the recognized costs for insurances with the sum of the annual premium for additional health insurances for the employees for 2015 at the amount of 148 k BGN, which are allocated proportionately among all WSs.

- Costs for 'Rents, including operative leasing' – based on the prices under the effective contracts an increase is envisaged in the costs for rent by 36 k BGN total for the Company as compared to 2015.
- Costs for communication services. In order to improve the activities for customer service and create conditions for better contacts and feedback from customers, the Company plans to implement in 2017 a free line for the customers within the scope of the services provided in the Call Center of Sofiyska Voda. It is expected with regard to this project that there will be increase in the costs as compared to 2015 by a total of 258 k BGN, calculated in line with the **Appendix Phone Line.**

The total cost of 258 k BGN is allocated per WS and activities as follows:

WS/Activity	Cost k BGN
WS Sofia Supply	174
WS Sofia Sewage	16
WS Sofia Treatment	45
WS non-potable	15
Non-regulated business	8
Total:	**258**

The other reason for the increase is the change in the cost for licenses in the customer information system SAP at a set step of increase of the customer's Contract Accounts in accordance with the enclosed justification in the response as per it. 12.1.17 of letter of the EWRC B-17-44-25/18.08.2016 namely:

	2015	2016	2017	2018	2019	2020	2021
Total number of the customers serviced by the operator, who use water supply service	617 197	637 511	641 203	644 895	648 586	652 278	655 970
Difference in the number of customers by years			24 006	3 692	3 692	3 692	3 692
Difference in the number of customers compared 2015			24 006	27 698	31 389	35 081	38 773
Number of packages of licenses having 1000 customers in one package in accordance with a license politics.			24.00	28.00	32.00	36.00	39.00
Costs by years on a number of packages (in k BGN)			22.10	25.78	29.46	33.15	35.91

In summary, the forecast increase by years for the relevant services and water systems is as follows

Phone line	**2017**	**2018**	**2019**	**2020**	**2021**
WS/Activity	**Costs k BGN**	**Costs k BGN**	**Costs k BGN**	**Costs k BGN**	**Costs k BGN**
WS Sofia Water supply	174	174	174	174	174
WS Sofia Sewerage	16	16	16	16	16
WS Sofia Treatment	45	45	45	45	45
WS Non-potable	15	15	15	15	15
Non-regulated activity	8	8	8	8	8
Total:	**258**	**258**	**258**	**258**	**258**

Increase in the cost for licenses in SAP	**2017**	**2018**	**2019**	**2020**	**2021**
WS/Activity	**Costs k BGN**	**Costs k BGN**	**Costs k BGN**	**Costs k BGN**	**Costs k BGN**
WS Sofia Water supply	15,64	18,24	20,85	23,46	25,41
WS Sofia Sewerage	1,26	1,47	1,68	1,89	2,04

WS Sofia Treatment	3,86	4,50	5,15	5,79	6,27
WS Non-potable					
Non-regulated activity	1,34	1,56	1,79	2,01	2,18
Total:	**22,10**	**25,78**	**29,46**	**33,15**	**35,91**

Increase total WS/ Activity	2017 Costs k BGN	2018 Costs k BGN	2019 Costs k BGN	2020 Costs k BGN	2021 Costs k BGN
WS Sofia Sewerage	18	18	18	18	18
WS Sofia Treatment	49	50	50	51	51
WS Non-potable	15	15	15	15	15
WS Non-potable	9	10	10	10	10
Non-regulated activity	**280**	**284**	**288**	**292**	**294**

On the other hand, the reduction in the cost for communication services is due to a reduction by 79,139.79 BGN as result of the reduction described in a response as per it.12.1.17 from a letter of the EWRC B-17-44-25/18.08.2016 connected to the software support of the previous billing system. This cost will not be made during the next years of BP 2017-2021. The distribution of the reduction in this cost by activities and water system is as follows:

Distribution of costs for license by services and WS (in k BGN)														
	WS Sofia								WS Bozhurishte		WS Non-potable		Total	
	Water supply		Sewerage		Wastewater treatment		Non-regulated business							
	2015	2017	2015	2017	2015	2017	2015	2017	2015	2017	2015	2017	2015	2017
Correction of the cost for license for the billing system		-53,56		-4,51		-13,83		-4,80		-0,02		-2,43		-79,14

- Costs for consultancy services. With regard to the application of the rules of the uniform regulatory reporting system and the requirement of the audit report in terms of this system, an increase in the costs for accounting and audit services is provided at the total amount of 19 k BGN for all activities

and WS compared to 2015, instead of the initial increase of 60 k BGN compared to 2015 in the initial version of BP 2017-2021;

- Costs for hired services for operating repair. As per the prepared repair program per activities, decrease is planned in the repairs assigned to contractors and also an increase in the share of the repairs performed with internal Company resources, and so to that in the costs for hired services for repair a decreasing trend is observed for the period 2017 – 2021.
- Reading individual meters – increase is envisaged to the amount of 100 k BGN (total for WS Sofia and WS Non-potable) compared to 2015 at reading of new contract prices and the increase is included in the sum of line 2.10 “Sums under contracts for invoicing” On this line are included also the costs for printing customer invoices and debt collection in compliance with the responses to EWRC as per it. 12.1.7 and the executed reclassification of this costs from Costs for hired services – Other to “Sums under contracts for billing”.

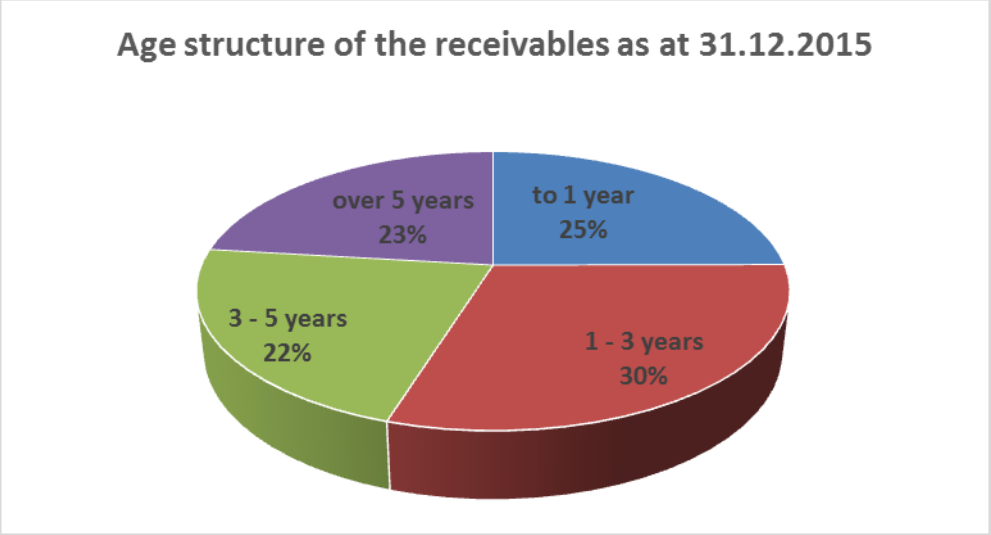
Debt collection by external debt collection companies – in connection with it. 13.5 from a protocol for discussion held on 11.11.2016 between representatives of EWRC and SV, the company submits additional justification regarding the costs for debt collection by external collection agencies:

Every month SV issues 600,000 invoices to its customers within the legally determined period for payment of 30 days. Despite the fact that 75% of the customer pay their bills regularly and do not have accumulated debts, about 150,000 customers have at least one overdue invoice and that is why different actions have to be taken for collection of the accumulated debt. The total amount of the outstanding receivables as at 31.12.2015 is 83 M BGN, from which **42.5**% are debts with period of the payment, which exceeds the 3-year limitation period.

The company has an internal structure with clearly determined debt collection processes. The particular processes are aimed at debt collection of all types of receivables depending on their age, type of customer and customer’s risk profile. Despite it, there are specific factors which affect strongly the debt collection process and require the use of alternative methods for debt collection as an addition to the internal resources of the company.

1. **General review of the number of customers and the age structure of receivables**

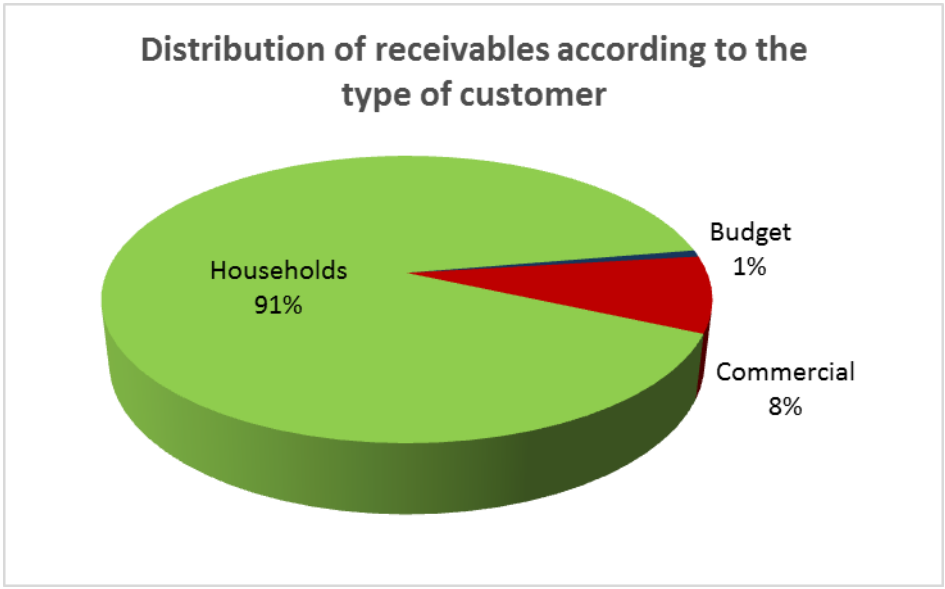
As at the end of 2015 the age structure of the receivables is as follows:



The amount of the receivables exceeding 5 years increases at the fastest rate and as at 31.12.2015 already occupies a share of **23.1 %** (compared to 16.0% as at 31.12.2014). The reason for the rate of increase of this group of receivables is due to the following factors: additional interests for delay, which are accumulated and the lowest efficiency of debt collection due to the fact that they are with expired 3-year limitation period.

Collection of these debts is very difficult due to the awareness of the customers about the 3-year statute of limitation as well as the policy of the company not to apply writing off of debts with expired statute of limitation. Despite the fact that many attempts were made for collection of debts by our internal teams and/or legal proceedings have been initiated, still a greater part of the debts with expired statute of limitation cannot be collected.

The next chart shows the distribution of receivables according to the type of customers:



The top chart shows that more than 90% of the total amount of the overdue debts is formed by the population. In regard to this category of customers, the company is deprived of the most extreme but in the meantime most effective methods of debt collection and that is – cutting off the water supply service. Despite the fact that the legislature allows the operators to cut off the service with a 15-day advance notice, in reality this measure is applied in very rare cases due to the technical incapacity for cutting off the service on the level of apartment and due to the legal effect related to the practice of the Commission for Protection of Competition in regard to cutting off the water supply service to customers of the 'household' type.

2. Presenting of internal organization and the activities of collection of overdue debts

A detailed description of the internal structure of the internal department Debt Collection in the company as well as specifics of the whole process and used methods for collection are presented in item 2.5 under the Commercial section (IV) of the current Business Plan 2017-2021

3. Limitations and additional difficulties for performing the activities on part of the internal teams for partial outsourcing of the activities to external sub-contractors

There are several reasons which require, in addition to the internal conditions, also a partial outsourcing of such activities to external partners:

1.1. Restrictions resulting from the legal framework which have an effect on the efficiency of the internal processes of collection

- ***Limited option for cutting off the services***

As it has been mentioned above, as opposed to many other utility companies Sofiyska Voda is in most cases deprived of the option to apply one of the most efficient methods such as cutting off the services to customers, who have not paid their bills regularly. Despite the fact that this has not been prohibited by the law, the institutions and the court apply a different interpretation which limits the application of this measure for this category of customers who form over 90% of the total amount of the overdue debts.

- ***Limited option for collection and storing of personal data***

In order to contact the debtors through one of the different channels for debt collection, it is necessary to keep customer information in regard to telephone number, email, personal number (which is a pre-condition for initiating legal proceedings) and others. The practice of the Personal Data Protection Commission strongly restricts the collection, keeping and using of similar data which limits the options of the company for efficient debt collection by means of court actions

1.2. Customer behavior in regard to the payment of utility services bills.

According to external publications and analyses (Association of the Collection Agencies in Bulgaria) as well as on the basis of carried out external inquiries and surveys on the level of the customer satisfaction, which address this topic, it is reported that the customers do not indicate with high priority the payment of the water bills. They prefer to pay with priority their debts to banks and financial institutions or other utility services (electricity, telecommunication services) which are at higher amounts as opposed to the invoice for water consumption since this service cannot be cut off immediately.

Another type of behavior, which is observed, is that the customers do not make monthly payments for their water bills due to their low amounts and prefer to make one delayed payment of a higher amount (per a quarter, half-year, or even once a year). Despite this, the absence of timely payments made by a greater part of the customers even with a low amount of the debt leads to an increase of the total amount of the debt.

1.3. Limitations of the execution of activities by the internal debt collection teams

There are two types of limitations of the efficient implementation of internal activities:

- ***Inability to contact all debtors***

The total number of the executed phone call (average per month – 25,000), visits to addresses (average per month – 4,000 addresses) and initiated legal proceedings (average per month - 400) are not enough to cover all debtors. Moreover, a lot of customers could not reached by the specific activity due to the lack of or the accuracy of a phone number, or due to the lack of personal data to start legal actions.

At the same time in connection with the legal proceedings such cannot initiated regarding debts with a period exceeding 3 years. They are 16% as at 31.12.2014 and 23% as at 31.12.2015 from the total amount of the outstanding debts.

The efficiency of the legal proceedings is additionally impacted by the nature of the enforcement procedure during which the debtor may object to the handed over writ of execution without the need for justification of the objection. On the other hand, the main proceedings are related to considerable court expenses and continues for extremely long period (it could continue a few years) due to the nature of the procedural conditions and ways for appeals

- ***Inability to collect the debts and even after numerous and various methods for debt collection applied internally***

There are customers, which despite all applied and different methods for debt collection (letters and out –of-court invitations, conducted phone conversations, visits

to addresses and other handed over writ of executions) still do not pay their debts. In these cases the debt collection process should continue by applying different approaches and methods. In such case it is necessary to assign such customer cases to external debt collection agency. Also the internal costs for continuation of the efforts for debt collection by the team in the company become unfoundedly high in caparison to the reducing possibility for debt collection. At the same time, we miss the opportunity to focus on the debts with different structure, age and risk profile of the debtor.

2. Criteria for assignment of debt collection to external debt collection agencies

The collection of outstanding debts by collection agencies is an additional debt collection channel, which completes the efforts within the company. It is a way of debt collection with wide practical application, which is used by a lot of companies as an additional alternative to the collection by own funds and resources. It is also an additional method when the needs cannot be covered only by internal resources and / or the efforts of the internal resources are unsuccessful.

In the specific case SV uses the services of the collection agencies because of the factors stated above, which determine also the selection criteria in terms of the customers, which are assigned to the external contractors.

Over the period covering the last few years (2012 - 2015) SV has worked with 3 debt collection agencies as follows: EOS Matrix (2012-2014), Law office *Popov and Partners* (2012-2014 and 2014 - 2016) and Finance Pro Collect OOD (2014-2016). The selection criteria regarding the assigned customer cases are: missing information in the database regarding UPN and phone number, as well as maturity of the debts. Below is presented a summarized statistics of all assigned packages with customer cases:

- **~ 33%** with missing unified personal number (UPN)
- **~ 37%** with missing phone number
- **~ 85%** with age of the debt exceeding 1 year

At the end of the contracts with *EOS Matrix* OOD and Law Office *Popov and Partners* (2012-2014) a total of 43, 454 customer cases were assigned to them, which is **27-28%** of the total number of all debtors of the company, whereas during the rest of the contractual period (2014-2016) of Finance Pro Collect OOD and Law office *Popov and partners* were assigned a total of 38,605 customer cases, which are **28%** from the total number of all debtors**.**

The achieved average debt collection for the period of the contracts is **51%** (*EOS Matrix* = 35%, Law office *Popov and partners* = 68%)

5. Exerted control over the work and the results of debt collection agencies.

It is very important to emphasize two things: first that the **contractors do not collect and do not handle physically money**. They consult customers with delayed payment of the debts by any of the opportunities for payment and second **that SV does not accept and does not do anything regarding the collection of debts of customers, who are assigned and are part of the work of the collection agencies**. It is stated in the contracts with the contractors and is ensured by a specific blocking of these receivables in the system for billing and customer service (SAP), thus excluding them from the negotiated lists of debtors, for which the company carries out activities related to debt collection by its internal teams – sending reminding letters, phone calls, visits to addresses and court actions, Thus is eliminated **the risk of duplication** of debt collection activities by internal and external resources.

Having executed contact with a debtor, assigned for work by a collection agency, the contractor registers a certain type of contact, which has been agreed by the company in advance. The type of the contact is contained in the daily reports, which are sent by the contractor and registered in the customer system by customer accounts.

On the other hand in the weekly report for updated balances and payments that were made, which are generated automatically by the systems and are sent by the company, are included only the ones for which there is at least one executed contact during the last 30 days. In case that there is no executed contact, even when a payment was made on behalf of the debtor over the last 30 days, this payment is excluded automatically and is not included in the weekly file. I.e. is not reported as a result of the activities of the contractor.

The types of customers, which the collection agencies register in their daily files, as well as for which it is reported that the payment is as result of the efforts of the contractor, are the following:

Type of contact	Reports the payment as a result from the efforts of the contractor
Not executed contact	No
Executed contact with other person	Yes
Wrong phone number	No
Signed deferred payment agreement	Yes
Executed contact with account holder	Yes
Visit to an address	Yes
Sent letter	Yes
Sent SMS	Yes

Upon full repayment of the debts by a customer, who was assigned to a contractor, the customer case is removed from the packages, assigned to the collection agencies. Thus is preventing the transfer of debts, respectively possible payments resulting from subsequently issued invoices.

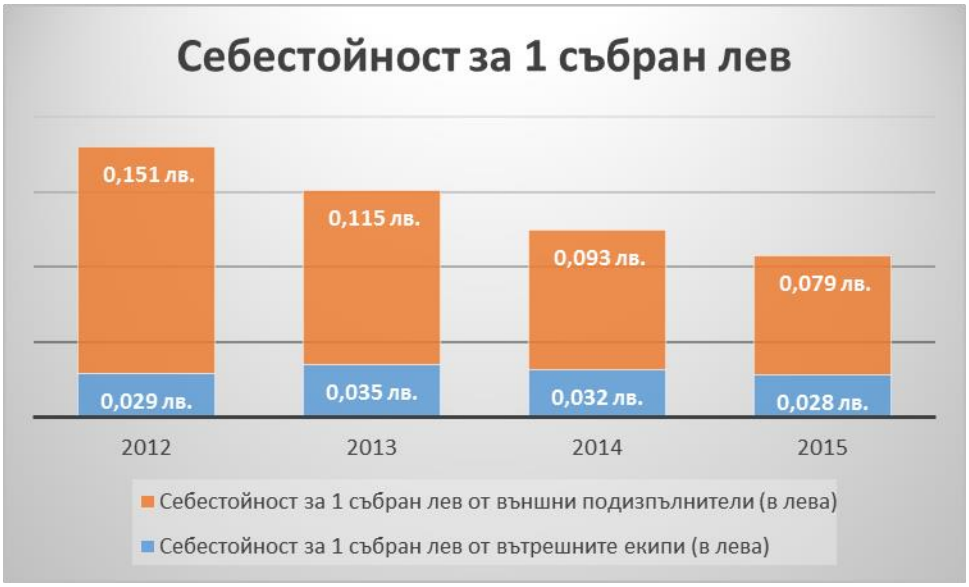
6. Analysis of the costs and efficiency. Comparison between the efficiency of the debt collection companies and the internal teams

The process on the collection of outstanding debts is a main activity, as it ensures the revenues from the regulated activity of the company. Of equal importance to the work of the Meter Reading Department (providing information on read consumption) and the Billing Department (billing the consumption read). As part of that process is also debt collection by hired contractors, who do not duplicate, but only complement that activity, which for one or another reason (specified above) is hindered or cannot be ensured by the internal company resources.

The necessity of joint work with hired contractors of debt collection services is determined by ensuring specific software to these specialized companies and mostly – the access to a rich database of contacts and addresses of end customers, with these suppliers have at their disposal pursuant to their legally regulated activity.

Sofiyska Voda AD exercises current control and monthly analyzes the results achieved by debt collection companies. The data from the analyses show a decrease in the expenses for hired debt collection services due to the following reasons:

- Reduction of the prices offered by the participants in each subsequent tender procedure
- A considerably better internal control on the assigned customer cases after the implementation of SAP
- Increase of the efficiency and size of collected amounts by the internal teams leading to a decrease of the cost per BGN lev collected:



Analyses were also made of the costs and efficiency of the activity of debt collection companies, as well as of the internal resources. On their basis a decision was taken to proceed with only one contractor instead of the present two. The procedure on the selection of a contractor was conducted in April, 2016. The signing of the new contract was delayed due to a complaint filed by one of the participants at the Commission for Protection of Competition (CPC). The CPC issued a decision in favor

of Sofiyska Voda AD, so the new contract will be signed to the end of November, 2016, which will terminate the present contract with Popov & Partners Law Office. The same expired on 01.09.2016, but was extended with an annex till the final decision of CPC. At the same time 4 additional positions were budgeted for 2017 to the team negotiating over the phone as it is one of the most efficient and profitable debt collection channels.

The data from the analysis of the debt collection costs comparing the activity of hired companies and the internal teams show that internal teams are comparatively more efficient and profitable. Due to the listed reasons the use of hired partners complements their activity via work with customer cases, for which the actions of the internal teams to not lead to the achievement of the desired results.

The graph below shows the distribution of the total amounts collected for the period 2013 – 2015, versus the respective costs made:

	Преговори по телефона	Преговори на адрес	АД Попов и партньори	Финанс Про Колект ООД	ЕОС Матрикс ООД
Средно събрана сума от клиентски случай	33,35	120,43	148,24	191,48	123,53
Средно извършен разход за един клиентски случй	1,11	5,97	11,43	17,23	15,34
Тежест на извършените разходи	3,3%	5,0%	7,7%	9,0%	12,4%

Analyses were also made of the costs and efficiency of the activity of debt collection companies, as well as of the internal resources. On their basis a decision was taken to proceed with only one contractor instead of the present two. The procedure on the selection of a contractor was conducted in April, 2016. The signing of the new contract was delayed due to a complaint filed by one of the participants at the Commission for Protection of Competition (CPC). The CPC issued a decision in favor of Sofiyska Voda AD, so the new contract will be signed to the end of November, 2016, which will terminate the present contract with Popov & Partners Law Office. The same expired on 01.09.2016, but was extended with an annex till the final decision of CPC. At the same time 4 additional positions were budgeted for 2017 to the team negotiating over the phone as it is one of the most efficient and profitable debt collection channels.

The data from the analysis of the debt collection costs comparing the activity of hired companies and the internal teams show that internal teams are comparatively more efficient and profitable. Due to the listed reasons the use of hired partners complements their activity via work with customer cases, for which the actions of the internal teams to not lead to the achievement of the desired results.

The graph below shows the distribution of the total amounts collected for the period 2013 – 2015, versus the respective costs made:

Efficiency compared to the total amount of the outstanding debts	**2012**	**2013**	**2014**	**2015**
Efficiency compared to the total amount of the outstanding debts	**2012**	**68,913**	**75,389**	**83,206**
Total amount of outstanding debts to the end of the year, in mln. BGN , of which:	**63,519**	42,600	47,294	56,170

Assigned to internal teams, in mln. BGN	40,943	26,314	28,095	27,036
Assigned to contractors, in mln. BGN	22,576	48,2%	41,7%	38,3%
Debt collection rate realized by internal teams (%)	51,3%	16,3%	15,2%	14,2%
Debt collection rate realized by contractors (%)	17,1%			

Because of the key nature of the process of debt collection in the overall activity of the company we consider that the use of that cost does not contradict art. 10, par. 7, it. 1 of the **Ordinance on the Regulation of the Prices of WSS Services** and by its nature this cost is analogous to recognized costs such as – printing of customer invoices by an external supplier and the services on invoice delivery to the customers.

In reference to it. 2 of the same paragraph (unjustified or extremely high costs) and in compliance with the principle of comparison of the size of the cost with "report data of the WSS operators for previous years", a considerable decrease and improved efficiency in that cost element is present for the years 2012-2015, as follows:

(k BGN)

Year	Regulated activity					Non-regulated business	Total
	Potable water	Sewerage	Wastewater treatment	Non-potable water	WS Bozhurishte		
2012	396.74	27.24	126.59	21.03	0.49	12.08	584.18

2013	335.55	23.09	107.15	17.8	0.42	10.46	494.47
2014	268.74	20.82	86.36	12.85	0.23	6.91	395.91
2015	209.88	17.66	54.19	9.52	0.06	5.48	296.79

Pursuant to it. 17.4.of the Directions ORPWSSS for the period 2017-2021 increases in nominal values compared to the reported cost for 2015 have not been envisaged.

- Costs for hired services for armed and anti-fire security. An increase is planned in 2017 from 200 k BGN, allocated between WS Sofia (191 k BGN) and WS Non-potable (19 k BGN), in view of the effective contract with the Sofia Directorate of Interior from 08.12.2010, and under it (art.5):

  (4) The Contracting authority is obliged, in case of a change with statutory document or other administrative act of the money or other compensation or other costs for the employees of the Ministry of Interior, following the notification in writing from the **contractor** for the specific increase in the respective time from the prices per unit under Appendix 2 and due amendment to Appendix 2, to pay the respective sum due, determined on the basis of the Decree of the Council of Ministers.

  (5) The Contracting authority, in conformity with the conditions and order of the effective legislation, is obliged to pay within one calendar month after the justified written request submitted by the **contractor** amounts for one-off money compensation under art.252 of the Law of the Ministry of Interior, in proportion to the length of service of the employee as a security officer at a site specified in Appendix 1 for the time from 18.11.2007 till the validity of this contract. **The Contracting authority** is obliged to pay within one calendar month after the justified written request submitted by the **contractor** amounts for one-off money compensation under art.255 of the Law of the Ministry of Interior. The sums for compensation are not included in the price under art.5 (1). VAT is charged on the sums.

The financial effect of these contractual obligations of the Company can be seen on a historical base from the report on the variation of the total reported cost for armed and anti-fire security in line with the uniform accounting system:

	2011	2012	2013	2014	*(k BGN)* 2015
Total cost of armed and fire security – WS Sofia supply and WS Non-potable supply	**4 156,20**	**4 113,81**	**4 703,66**	**4 821,92**	**5 135,69**
Annual change		-42,39	589,85	118,26	313,77
Average annual change					*244,87*

In addition, while making internal check of the protocols for paid compensation at the retirement of the employees from the Sofia Directorate of Interior through the years, it is found that the average value of the years of service of these security officers, for

whom SV pays compensation by virtue of the mentioned contract, is 6.24 years for 2014 as compared to 7.35 years in 2015.

Therefore, our opinion is that the planned one-off increase in the costs of 200 k BGN in 2017 is rather conservative and it can even turn out to be insufficient if the future reported inflation for the period of the BP 2017 - 2021 does not cover the indexations, which the Council of Ministers may impose.

- Other costs for hired services
  - For 2015 and 2016 adjustments are made in the sum on the line Other costs for hired services, as the costs for which new lines are planned in the model are referred to the respective line in the electronic model. The adjustment is made for the purpose of comparing the costs per years. The adjustment covers the following costs:
    - Check of the measuring devices
    - Lab samples
    - Hired services for sludge utilization.

- Costs for remunerations and social contributions

In reference to it. 13.1. of the Minutes of the meeting conducted on 11.11.2016, Sofiyska Voda AD corrects the costs for remuneration and security benefits as follows: In the calculations of the costs for remunerations and social contributions an annual increase is provided in the % for professional qualification and experience, as well as an increase of 3%, which is based on the market survey of the remunerations over the last years and forecasts for their increase from leading companies in this sphere. The Company has a signed collective labor agreement, and the conditions in it in terms of the remunerations have been taken into account and included in the calculations of the remuneration costs. In accordance with these conditions, the Company is obliged to observe the minimum remuneration levels for the different staff categories, which are bound with the minimum work salary for the country, as well to charge % for professional experience and qualification equal to 1% for each services year. The minimum levels are calculated on the basis of the medium-term budget forecasts for the minimum salary, as in 2017 and 2018 its amount is 460 BGN, and in the next 3 years the step of its increase is 20 BGN. 1% increase in the amount of the social contributions has been also provided in the period 2019 – 2021.

The costs for remunerations are allocated per services and systems in line with the principles of the uniform regulatory reporting system. The first step is referring the direct costs for remuneration to the respective service based on the cost center. Then, allocation is done of the costs for remunerations for supporting and administrative staff. These costs are allocated between regulated and non-regulated activities and between the regulated services in proportion to the share of the direct costs for the

respective service versus the total sum of the direct costs, from which the depreciation costs have been deducted. The forecasted expenses for remunerations and insurances are calculated according to it. 18.3 from the Instructions for formation of the prices of the WSS services using the *price cap* method for the regulatory period 2017-2021 (Instructions on prices) according to the staffing schedule. On the other hand, the reporting period for 2015 is based on actually charged expenses for remunerations and insurances which include the actual impact in 2015 due to non-attendance (which did not lead to cost) for example – sick leaves, unpaid leaves and maternity leaves, which are positions in the recruitment process, which did not lead to expenses.

As per the Ordinance on the structure and organization of the salary and the signed Collective Labor Agreement, the employer is obliged to charge for each year of professional experience and qualification additional remuneration to the amount of 1%. Each year the amount of the additional remuneration for professional experience and qualification is increased by 1%, which in turn leads to increase in the nominal amount of the remuneration due to the cumulative effect from the annual increases compared to the previous years. In addition, according to the collective labor agreement, the company is obliged to comply with minimum basic levels of remuneration for the different categories of personnel, which are bound to the minimum wage for the country, corrected by a coefficient.

The circumstances have been listed below leading to the respective increases of the total costs for remuneration and benefits for WS “Main” (for supply, sewerage, treatment and presented in Report 5) versus 2015:

- After a discussion conducted on 11.11.2016 in the present revised version of Business Plan 2017 - 2021 the remunerations for the years 2018-2021 have been corrected, so that the average size of the remuneration per employee on a Full-Time Equivalent grows by 2.04% each year as is evident from Report № 5. The increase in the remuneration per employee on Full-Time Equivalent in 2017 compared to 2015 by 8.12% is due to the fact that in 2016 the remuneration of low-paid employees have been adjusted as of 01.07.2016, as the growth rate of the average gross work salary in the company against 2015 is 6.08% (over 600 employees on different positions benefit from that increase). We consider that exactly that real cost of the company to 2016 should be taken as a basis. In the total growth of 6.08% a percentage for the professional experience and qualification with a 1% growth has been included as well as 0.61% growth (as of January 2016). In addition, the increase in question in 2016 is based on agreement between the company’s management and the trade unions represented at the company. To the enclosed increase from 2016 also a 2.04% increase has been set for 2017 of the average cost per employee on Full-Time Equivalent., which is reflected in the total increase of the cost in 2017 compared to 2015 of 8.12%. If the company applies 4% average increase of the remuneration on FTE in 2017 compared to 2015 that would lead to the necessity of real decrease of work salaries in the company compared to the

already achieved levels in 2016. For the period 2017-2021 2.04% growth has been envisaged, as is shown in it. 13.1 of the Minutes of the discussion.

- In addition, it should be borne in mind that in 2016 Mercer (a leading company in the area of the remunerations and benefits market research) conducted a global research on the remunerations in the country and the expectations of the business for their change over the next year. The research shows that the average growth of remuneration for 2016 is in the size of 4% as the forecasts of the business for 2017 are for growth with another 4%. Furthermore, according to data of the NSI, for the last 3 years the average gross salary for the country has grown by close to 15%, and for Sofia – by 12%.

As a result of the meeting with EWRC held on 22.12.2016, the following additional corrections in the costs for remunerations are made:

The costs for remuneration are adjusted according to it. 13.1 from the protocol about the discussion held on 11.11.2016, so that the average amount of remuneration per employee per FTE (KBGN/FTE) *for all services and water supply systems is increasing with the following* pace:

- For 2017 with 4,0% compared to 2015
- For the remaining years of the Business plan– with 2,04% compared to the previous year.

The adjustment is seen from the ratio of annual ammounts in **Report No 5 Personnel** from the electronic model of the Business plan 2017-2021 on the following row from Report 5:

№	Description	Regulated activity Water supply					
		2015	2017	2018	2019	2020	2021
5.1	**Average amount of remuneration per an FTE (k BGN/FTE)**	20,09	20,90	21,33	21,76	22,21	22,66
	Variance of remuneration per an FTE (k BGN/FTE)		*4,00%*	*2,04%*	*2,04%*	*2,04%*	*2,04%*

№	Description	Regulated activity Sewerage					
		2015	2017	2018	2019	2020	2021
5.1	***Average amount of remuneration per an FTE (k BGN/FTE)***	18,51	19,25	19,65	20,05	20,45	20,87

	Variance of remuneration per an FTE (k BGN/FTE)		4,00%	2,04%	2,04%	2,04%	2,04%

№	Description	Regulated activity					
		Wastewater treatment					
		2015	2017	2018	2019	2020	2021
5.1	**Average amount of remuneration per an FTE (k BGN/FTE)**	20,44	21,25	21,69	22,13	22,58	23,04
	Variance of remuneration per an FTE (k BGN/FTE)		*4,00%*	*2,04%*	*2,04%*	*2,04%*	*2,04%*

№	Description	Water supply to other WSS operator					
		2015	2017	2018	2019	2020	2021
5.1	**Average amount of remuneration per an FTE (k BGN/FTE)**	12,82	13,34	13,61	13,89	14,17	14,46
	Variance of remuneration per an FTE (k BGN/FTE)		*4,00%*	*2,04%*	*2,04%*	*2,04%*	*2,04%*

№	Description	Supply of non-potable water					
		2015	2017	2018	2019	2020	2021
5.1	**Average amount of remuneration per an FTE (k BGN/FTE)**	17,49	18,19	18,56	18,94	19,33	19,72
	Variance of remuneration per an FTE (k BGN/FTE)		*4,00%*	*2,04%*	*2,04%*	*2,04%*	*2,04%*

- Other costs

In addition, as per the Instructions on the prices, in the **Appendix 'Costs Other'** a detailed report is provided for the costs included in the groups Costs for materials, Costs for hired services – Other and Other costs – Other, which reflects the corrections under it. 12 of EWRC Letter B-17-33-25 / 18.08.2016, as well as the

decrease of the costs for advertisement hired services from 57.14 thousand BGN to 39 361.11 thousand BGN as follows:
Expenses for hired services for advertising prior to reduction (in BGN)

Information service for publications and announcing related to the activity of the company	17 361,11
Participation in the forum "World Water Day"'; participation in public events, incl. of the Bulgarian Water Association; events related to environmental protection and participation in professional forums related to the WSS infrastructure, innovations, exchange of experience..	12 000,00
Participation in the conference "Regular Conference of the water sector" and "Annual Meeting of Government - Business "	20 000,00
Service for the making of an educational video about the operations of the WWTP Kubratovo (on the occasion of its 30th anniversary) to support the educational activity among the classes with younger students in partnership	7 775,78
	57 136,89

Expenses after reductions:

Information service for publications and announcing related to the activity of the company	17 361,11
Participation in the forum "World Water Day"'; participation in public events, incl. of the Bulgarian Water Association; events related to environmental protection and participation in professional forums related to the WSS infrastructure, innovations, exchange of experience..	12 000,00
Participation in the conference "Regular Conference of the water sector" and "Annual Meeting of Government - Business "	10 000,00
Service for the making of an educational video about the operations of the WWTP Kubratovo (on the occasion of its 30th anniversary) to support the educational activity among the classes with younger students in partnership	0,00
	39 361,11

Regarding the costs of advertisement materials in the size of 16.24 thousand BGN:

	сума в лв.
Paper cups for the volunteering campaign of Sofiyska Voda - "Quench the Heat" which takes place for a fifth consecutive year in Sofia	1 500,00
Corporate book separators given as gifts at the end of the year to employees and partners	1 120,00
Corporate pads with a calendar provided as gifts at the end of the year to employees and partners	3 353,40
Advertising notebooks given as gifts at the end of the year to employees and partners	7 130,00
Roll banner	282,15
Pens given as gifts at the end of the year to employees and partners	2 853,00
Total:	**16 238,55**

The Company considers that they do not fall into the hypotheses of art. 10, par. 7, it. 1 of the ORPWSSS (costs not related to the regulated activity), nor in the hypotheses of art. 10, par. 7, it. 2 (unjustified or extremely high costs) and, respectively, the above costs are retained also in the present version of the business plan.

- Costs related to ISPA

The cost for paying the debts for interests and principals with regard to ISPA has been decreased as compared the one approved in the BP 2016 based on the applied repayment plan of the MoEW, as follows:

Decrease	2017	2018	2019	2020	(k BGN) 2021
Supply	-56,84	-70,14	-83,44	-96,75	-110,05
Sewerage	-7,03	-8,67	-10,31	-11,96	-13,60
Treatment	-23,24	-28,68	-34,12	-39,56	-45,00
	-87,10	**-107,49**	**-127,88**	**-148,27**	**-168,66**

The calculations for the mentioned decreases per years are given in the **Appendix 'Costs for ISPA – Calculations'.**

The comparative information and explanation of the variations per years are also given in the section **Analysis of the efficiency of the costs** in part II Technical part.

Other clarifications:

In the present revised Business Plan 2017-2021 a correction has been made to the values for 2016-2021 on line 2.3 Long-term debts, with which assets have been acquired under contracts for financial leasing from Report № 19 "Return on capital", namely: in the initial business plan from June, 2016, on that line were specified the values of the annual payments on principals under contracts of financial leasing, while the instructions for completing that report require specification of balances of the remaining principals – moreover, as an average value at the beginning and at the end of the period. Respectively, on that line the correct values have been specified according to years, as follows:

					(in k BGN)
2016	**2017**	**2018**	**2019**	**2020**	**2021**
2 957	3 355	3 633	3 912	3 858	3 912

The impact of that correction is decrease of the annual rate of return due to increase of the relative share of the borrowed capital. On the other hand, in the calculation of Report № 15 Forecast statement of cash flow the annual amounts for payment of principals under financial leasing contracts have been taken into consideration.

Furthermore, in connection with a question under it 21.1 of the Minutes of the conducted discussion regarding the justification of the increase of equity with the full size of the profit from Report № 14 – we are providing the following specifications:

In BP 2017-2021 in reference to the change in equity over the years, the principles have been set in the reflecting of the changes in equity according to a certified by an independent auditor annual financial statement and according to the International Reporting Standards and as is visible from the disclosure below in the Annual Financial Statement 2015, as follows:

Separate financial statement for the changes in equity

In K BGN	Note	Registered capital	Statutory reserves	Profit and loss	Total
Balance on 1 January 2014		8,884	10,774	121,933	141,591
Total comprehensive income for the period					
Profit for the year		-	-	16,387	16,387
Other comprehensive income, net of taxes		-	-	(76)	(76)
Total comprehensive income for the year		-	-	16,311	16,311
Balance on 31 December2014	18	8,884	10,774	138,244	157,902
Balance on 1 January 2015		8,884	10,774	138,244	157,902
Total comprehensive income for the period					
Profit for the year		-	-	22,469	22,469
Other comprehensive income, net of taxes		-	-	(61)	(61)
Total comprehensive income year		-	-	22,408	22,408
Balance on 31 December 2015	18	8,884	10,774	160,652	180,310

The disclosure above corresponds to the statement of the financial position below:

Separate statement of the financial position

In k BGN	*Note*	31 December 2015	31 December 2014
Non-current assets			
Property, plant and equipment	*13*	16,261	17,353
Intangible assets	*14*	279,016	272,510
Investments in subsidiaries		5	5
Deferred tax assets	*20*	6,175	5,842
Other receivables and prepayments	*16*	983	357

Non-current assets		302,440	296,067
Inventories	*15*	1,346	1,701
Trade and other receivables	*16*	32,869	31,659
Income tax receivables		-	573
Receivables from related parties	*24,30*	60	142
Cash and cash equivalent	*17,24*	16,818	12,382
Total current assets		51,093	46,457
Total assets		353,533	342,524

Equity			
Share capital	*18*	8,884	8,884
Reserves	*18*	10,774	10,774
Retained earnings		160,652	138,244
Total equity		180,310	157,902

Separate statement of the financial position (continued)

In k BGN	***Note***	**31 December 2015**	**31 December 2014**
Liabilities			
Loans and borrowings	*19,24*	35,793	44,598
Finance lease liabilities	*19,24*	1,469	1,573
Employee benefits	*26*	883	774
Deferred income	*29*	1,816	2,149
Trade and other payables	*21,28*	10,469	8,247
Non-current liabilities		50,430	57,341
Loans and borrowings	*19,24*	80,077	79,934
Finance lease liabilities	*19,24*	1,178	923
Revenues for future period	*28*	200	-
Income tax liabilities	*23*	660	-
Payables to related parties	*24,30*	4,813	6,300
Trade and other payables	*21*	29,423	33,603
Provisions	*22*	5,973	5,951
Employee benefits	*26*	469	570
Total current liabilities		122,793	127,281
Current liabilities		173,223	184,622
Total equity and liabilities		353,533	342,524

As well as of:

Separate statement of the profit and loss and statement of comprehensive income

For the year ending on 31 December

In k BGN	*Note*	2015	2014
Revenue	*4*	124,968	121,853
Other income	*5*	1,760	1,904
Construction revenue	*6*	30,797	30,888
		157,525	154,645
Expenses for materials	*7*	(8,738)	(8,994)
Expenses for hired services	*8*	(25,303)	(26,564)
Depreciation and amortization	*13,14*	(28,907)	(27,666)
Employee benefit expenses	*9*	(16,900)	(16,685)
Social security contributions and other social expenses	*9*	(4,399)	(4,265)
Expenses for impairment of trade receivables	*24*	(8,098)	(6,958)
Other expenses	*10*	(2,983)	(7,552)
Construction expenses	*6*	(30,797)	(30,888)
Operating profit		31,400	25,073
Finance income	*11*	55	57
Finance costs	*11*	(6,398)	(6,824)
Net finance costs		(6,343)	(6,767)
Profit before tax		25,057	18,306
Tax expense	*12*	(2,588)	(1,919)
Profit for the period		22,469	16,387

In connection with it. 17.1 from the protocol about conducted meeting, the company provides the following information:

In the supplemented and amended Loan agreement between SV and the European Bank for Reconstruction and Development (valid at the moment) in part 6.01 item (e) is settled that the company cannot distribute dividends until the subordinated loan is paid off.

Section 6.01. Dividends

(a) Except as expressly provided herein, the Borrower shall not declare or pay any dividend, or make any distribution on its share capital, or purchase, redeem or otherwise acquire any shares of capital of the Borrower or any option over the same, or make any payment of principal or interest on any Subordinated Debt, or pay to any Shareholder or Affiliate any management or other fees, or fees or expenses in respect of any work carried out on behalf or for the Borrower (except for any payments made under the original duration of the Technical Services Agreements and the Asset Management Agreement respectively and any other agreement with an Affiliate if the Bank has consented to bring such agreement within the scope of the present exception) unless:

(1) No Event of Default or Potential Event of Default has occurred and is continuing or would occur as a result of the proposed payment;

(2) the balance amount standing to the credit of the Debt Service Reserve Account will be no less than the sum of all aggregate principal and interest due to the Bank under this Agreement at the next Interest Payment Date; and

(3) the Banking Case would, having taken into account the amount of the proposed distribution, show that the Borrower would maintain a FADSCR of at least 1.3:1 from the Calculation Date immediately following the date on which the payment is proposed to be made.

(b) The short-term Debt which is incurred by the Borrower as permitted by Section 6.04(a)(2) may, notwithstanding the remainder of this Section 6.01, be on terms that is paid by the Borrower in accordance with its terms until such time as an Event of Default or Potential Event of Default has occurred and is continuing, in which case no payments shall be made in respect of such Short-term Debt (whether of principal, interest or otherwise) until such time as no Event of Default or Potential Event of Default exists.

(c) The Borrower shall not make any payment of Base Fees (as defined in the Asset Management Agreement and the Technical Services Agreements, respectively) under the Asset Management Agreement or any Technical Services Agreement unless no Event of Default or Potential Event of Default has occurred and is continuing or would occur as a result of the proposed payment.

(d) Notwithstanding the other provisions of this Section 6.01, the Borrower shall not make any payment of principal or interest on any Subordinated Debt if the interest rate applicable to such Subordinated Debt (whether such interest is to be paid or accrued) exceeds 6.0% per annum above EURIBOR or LIBOR, as the case may be.

(e) Notwithstanding the other provisions of this Section 6.01, the Borrower shall not declare or pay any dividend, or make any distribution on its share capital, or purchase, redeem or otherwise acquire any shares of capital of the Borrower or any option over the same unless prior thereto all Subordinated Debt shall have been fully repaid.

It is evident from the text above that item (e) forbids the payment of dividends, except if before it the subordinated debt is paid Due to the reasons stated above, SV does not plan the payment of dividend under the Subordinated debt of the company is paid. Copies of the mentioned debts are enclosed to this Business Plan.

Moreover, the payment of the dividends upon existing exposures to EBRD and the mother company is illogical from a business pointy of view and would additionally

worsen the financial position of the company and would pose a risk on the servicing of the two loans.

In connection with it 21.2 from a protocol about a conducted meeting the company provides the following information:

The rate of return on equity used by Sofiyska Voda in this Business plan is the one defined in the Concession Agreement and valid as at the date of preparation of the BP – 17%. In its letter СОА16-ТД26-3913 (22)/07.11.2016 to the EWRC and SV, the MoS also expressed its position that at the moment the clauses of the Concession Agreement (including the rate of return on equity) have not changed i.e. should be taken into consideration in the BP of the company.

Despite the clarifications above as result of the meeting held with the EWRC on 22.12.2016 the company prepared a corrected version of the electronic models to BP 2017-2021, according to which in the corrected models payment of dividends to the shareholders is set as follows:

The forecasted value of the rate of return on capital calculated in accordance with art. 12 of the Ordinance on price is calculated Report 19 Rate of return from the electronic model to BP 2017-2021 and the same is reduced in accordance with the initially filed and the revised in November 2016 BP as result of the forecasted payments of dividends to shareholders in the years 2020-2021 set in the corrected electronic models, after the payment of the Senior Loan to the EBRD in October 2010. As result of it the cost of equity Report 19 Rate of return in the years 2020 and 2021 does not increase compared to the cost of equity in 2019 as all the profit from the preceding year is set for payment in the following. Respectively, for all WS of the operator a single rate of return is applied as follows:

№	Description	Unit of measure	2015	2016	2017	2018	2019	2020	2021
1	**Regulatory owners' equity**	**(000 BGN)**	**157 841**	**180 310**	**215 708**	**252 651**	**294 265**	**294 265**	**294 265**
1.1	**Owners' equity**		157 841	180 310	215 708	252 651	294 265	294 265	294 265
1.2	**Own long-term assets and public long-term assets, built with own funds**		**157 841**	**180 310**	**583 814**	**627 547**	**665 616**	**698 755**	**731 097**
2	**Borrowed capital, incl.**	**(000 BGN)**	**123 625**	**114 873**	**102 652**	**83 199**	**60 191**	**36 845**	**18 137**
2.1	Long-term debt, excluding finance leases	(000 BGN)	120 979	111 916	99 297	79 566	56 280	32 987	14 225
2.2	Weighted average rate of return on loans in item 2.1	%	4.23%	4.29%	4.29%	4.21%	4.68%	5.44%	6.31%
2.3	Long-term debt, which is used for acquiring assets under finance leases	(000 BGN)	2 647	2 957	3 355	3 633	3 912	3 858	3 912
2.4	Weighted average rate of return on loans in item 2.3	%	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%
2.5	Short-term debt	(000 BGN)	0	0	0	0	0	0	0
2.6	Weighted average rate of return on loans in item 2.5	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	**Tax liabilities**	**%**	**10.00%**	**10.00%**	**10.00%**	**10.00%**	**10.00%**	**10.00%**	**10.00%**
4	**Rate of return on equity, determined by the EWRC**	**%**	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%
5.1.	**Rate of return on borrowed capital**	**%**	**4.22%**	**4.28%**	**4.26%**	**4.18%**	**4.61%**	**5.24%**	**5.72%**
5.2.	**Marginal rate of return on borrowed capital, determined by the EWRC**	**%**	4.60%	4.60%	4.60%	4.60%	4.60%	4.60%	4.60%
6	**Share of equity**	**%**	**56.08%**	**61.08%**	**67.76%**	**75.23%**	**83.02%**	**88.87%**	**94.19%**
7	**Share of borrowed capital**	**%**	**43.92%**	**38.92%**	**32.24%**	**24.77%**	**16.98%**	**11.13%**	**5.81%**
8	**RATE OF RETURN**	**%**	**12.45%**	**13.20%**	**14.17%**	**15.25%**	**16.46%**	**17.30%**	**18.06%**
8.1	Return for the "Water supply" service	(000 BGN)			40 827	45 672	50 943	54 480	58 099
8.3	Return for the "Sewerage" service	(000 BGN)			16 209	18 972	21 803	24 106	26 208
8.4	Return for the "Wastewater treatment" service	(000 BGN)			5 712	6 637	7 246	7 528	7 571
9	**Return**	**(000 BGN)**			**62 748**	**71 281**	**79 992**	**86 113**	**91 878**

In the corrected electronic models in Report 15 Estimated report on cash flow payments of dividend are set to the full amount of the net profit from the previous accounting period as follows:

The profit according to Report No 14 Estimated profit and loss account:

							(k BGN)
Name	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Profit/ Loss	22 469	35 398	36 943	41 614	46 375	47 221	46 382

Payments of dividends set in Report No 15 Estimated report on cash flow:

							(k BGN)
Name	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Payment of dividends to owners	0	0	0	0	0	-46 375	-47 221

4.1 ANALYSIS OF THE COSTS PER ELEMENTS FOR THE WATER SUPPLY SERVICE

4.1.1 Costs for materials

- **Costs for materials for disinfection**

The cost for chlorine is calculated based on the following prerequisites:

- The current average (as at the date of the development of the Business Plan) price for chlorine and its supply.
- The forecast volumes of water at the inlet of the water system.
- Specific consumption of a ton of chlorine per m^3 of water for initial and subsequent treatment, in line with the quality of the raw water for the last 3 years and the operative activity of the Company.

    - The lab analyses for microbiological indicators and total organic carbon (TOC) of the raw water show a slight worsening trend in the last 3 years by about 6% of the TOC from 2.885 mg/l in 2014 to 3.09 mg/l in 2015 and by about 2% under microbiological indicators. Assuming that the trend will be kept, an increase is needed of the doses of the supplied chlorine for the initial and subsequent chlorination by about 4%.
    - In 2017 a new route is provided for commissioning in the PWTP Pancharevo for separate chlorination of the water in the Kremikovtsi water main. The average consumption is expected to be 0.425 kg/h, which on its part leads to 1.5% additional volumes of chlorine on an annual basis.

Similar calculation of the chlorine consumption is given in the table below.

Cost for chlorine – total for WS Sofia and WS Bozhurishte							
	Unit of measure	2015	2017	2018	2019	2020	2021
Q – Beli Iskar - primary treatment	m^3	35 613 665	36 762 182	36 651 231	36 957 231	37 113 231	37 269 231
CHLORINE - specific consumption	tone/m^3	0,000001716	0,000001810	0,000001810	0,000001810	0,000001810	0,000001810
CHLORINE - quantity	tone	61	67	66	67	67	67
Q - Sofia - subsequent treatment	m^3	158 395 233	153 924 549	148 258 235	143 942 580	139 549 338	135 497 150
CHLORINE - specific consumption	tone/m^3	0,000001176	0,000001240	0,000001240	0,000001240	0,000001240	0,000001240
CHLORINE – quantity	tone	186,21	190,91	183,88	178,53	173,08	168,05
Total chlorine	**tone**	**247,32**	**257,46**	**250,23**	**245,43**	**240,26**	**235,52**
Average price (incl. transport)	**BGN**	**1 254,27**	**1 200,00**	**1 200,00**	**1 200,00**	**1 200,00**	**1 200,00**
Cost	**BGN thousand**	**310,21**	**308,95**	**300,27**	**294,52**	**288,32**	**282,62**
from which:							
Cost for WS Sofia	**BGN thousand**	**310,12**	**308,86**	**300,19**	**294,43**	**288,23**	**282,54**
Cost WS Bozhurishte	**BGN thousand**	**0,09**	**0,09**	**0,08**	**0,08**	**0,08**	**0,08**

Note: The reported costs for disinfection for 2015 as per the uniform accounting system at the amount of 352 k BGN for WS Sofia, apart from the 310.1 k BGN for the delivery of chlorine, includes also costs for bleach and other chemicals.

Costs for materials for disinfection for chlorine for the main WS Sofia and WS Bozhurishte, which are due to the increased forecasted specific cost per ton of chlorine per cubic meter of water are stated in column “Increase (additional costs) of Report 12.1 Costs – increase and reduction, line 1.1.1. as follows”

Total for WS Sofia and WS Bozhurishte

	Unit of measure	2017	2018	2019	2020	2021
Q – Beli Iskar - primary treatment	m^3	36 762 182	36 651 231	36 957 231	37 113 231	37 269 231
CHLORINE – increase of the specific consumption compared to 2015	tone/ m^3	0.000000094	0.000000094	0.000000094	0.000000094	0.000000094
CHLORINE - quantity	Ton	3	3	3	4	4

Q - Sofia – secondary treatment	m^3	153 924 549	148 258 235	143 942 580	139 549 338	135 497 150
CHLORINE – increase of the specific consumption compared to 2015	ton/ m^3	0.000000065	0.000000065	0.000000065	0.000000065	0.000000065
CHLORINE – quantity	ton	10	10	9	9	9
Total chlorine	**Ton**	**13**	**13**	**13**	**13**	**12**
Average price (incl. transport)	**BGN**	**1 200**	**1 200**	**1 200**	**1 200**	**1 200**
Cost	**k BGN**	**16.1063**	**15.6541**	**15.3539**	**15.0307**	**14.7339**
from which:						
Cost for WS Sofia	**k BGN**	**16.1018**	**15.6497**	**15.3496**	**15.0265**	**14.7298**
Cost WS Bozhurishte	**k BGN**	**0.0045**	**0.0044**	**0.0043**	**0.0042**	**0.0041**

In column "**Reduction (efficiency)**" is stated the impact from the lower average current price and the lower water volumes at the inlet compared to 2015.

	Unit of measure	2015	2017	2018	2019	2020	2021
Q – Beli Iskar - primary treatment	m^3	35 613 665	36 762 182	36 651 231	36 957 231	37 113 231	37 269 231
CHLORINE – increase of the specific consumption under equal conditions in 2015	tone/ m^3	0.000001716	0.000001716	0.000001716	0.000001716	0.000001716	0.000001716
CHLORINE - quantity	ton	61	63	63	63	64	64
Q - Sofia – secondary treatment	m^3	158 395 233	153 924 549	148 258 235	143 942 580	139 549 338	135 497 150
CHLORINE – increase of the specific consumption under equal conditions in 2015	ton/ m^3	0.000001176	0.000001176	0.000001176	0.000001176	0.000001176	0.000001176
CHLORINE – quantity	ton	186	181	174	169	164	159
Total chlorine	**ton**	**247**	**244**	**237**	**233**	**228**	**223**
Average price (incl.	**BGN**	**1 254**	**1 200**	**1 200**	**1 200**	**1 200**	**1 200**

transport)							
Cost	**k BGN**	**310.21**	**292.84**	**284.62**	**279.16**	**273.28**	**267.89**

k BGN	Cost for WS Sofia	**310.12**	**292.76**	**284.54**	**279.08**	**273.21**	**267.81**
k BGN	Cost WS Bozhurishte	**0.09**	**0.08**	**0.08**	**0.08**	**0.08**	**0.07**

- **Costs for materials for coagulants**

The costs for coagulants for the water supply service for the period of the BP 2017 - 2021 are calculated on the basis of the following prerequisites:

- The current (as at the date of the BP preparation) price for coagulant polyaliminium chloride hydroxide sulphate.
- Forecast volumes of water at the inlet of the PWTP.
- Specific consumption of coagulant per m3 of water for the reporting 2015.

Similar calculation of the costs for coagulants is given in the table below.

Cost for coagulants - total WS Sofia and WS Bozhurishte							
	Unit of measurement	**2015**	**2017**	**2018**	**2019**	**2020**	**2021**
Quantities at the inlet WS	m^3	158 395 233	153 924 549	148 258 235	143 942 580	139 549 338	135 497 150
Quantities at the inlet PWTP	m^3	121 879 714	116 253 935	109 816 444	105 160 278	100 593 044	96 353 446
Specific cost coagulant	tone/m^3	0,000003184	0,000003184	0,000003184	0,000003184	0,000003184	0,000003184
quantity coagulant	tone	388,08	370,17	349,67	334,85	320,30	306,80
current price	**BGN./tone**	**850,00**	**850,00**	**850,00**	**850,00**	**850,00**	**850,00**
cost	**BGN thousand**	**329,87**	**314,65**	**297,22**	**284,62**	**272,26**	**260,78**
from which:							
Cost for WS Sofia	**BGN thousand.**	**329,78**	**314,56**	**297,14**	**284,54**	**272,18**	**260,71**
Cost for WS Bozhurishte	**BGN thousand**	**0,09**	**0,09**	**0,08**	**0,08**	**0,08**	**0,07**

The total effect of the described above circumstances for WS Sofia is a decrease in the costs for coagulants as compared to the reporting 2015, and this effect is entered in the columns ‘Decrease (efficiency) of report 12.1 Costs-increase and decrease as follows:

				(k BGN)
2017	**2018**	**2019**	**2020**	**2021**
-15	-33	-45	-58	-69

- The costs for the LTC are forecasted without variation as compared to 2015.
- The costs for electricity for technological needs.

The forecast consumption of electricity for technological needs for the water supply service for the period of the BP 2017 - 2021 is:

Year	2015	2017	2018	2019	2020	2021
WS Sofia – actuals 2015	900.46	737.97	745.70	733.23	714.15	697.11
Distributed cost from WS Beli Iskar in accordance with article15 from the Instructions on prices	6.12	4.48	4.48	4.48	4.48	4.48
Cost (k BGN)	**906.59**	**742.44**	**750.18**	**737.70**	**718.63**	**701.59**

In addition to the specified below effects in quantities, the variations of the electricity consumption for technological needs as compared to the reporting 2015 result from the following prices effective at the date of preparing the business plan:

Low voltage	current prices
Active energy	67,33
Excise (2.00 BGN / MWh)	2,00
Commitment to society	36,83
Access to the grid	1,17
Transmission over the distribution network LV	27,08
Transmission through the grid	7,36
Balancing the electricity distribution system	0,10
Price per 1 MWh active power low voltage	**141,87**
Medium voltage	**Current prices**
active energy	67,33
Excise (2.00 BGN / MWh)	2,00
Commitment to society	36,83
Access to the grid	1,17
Transmission over the distribution network MV	8,37
Transmission through the grid	7,36
Balancing the electricity distribution system	0,10
Price per 1 MWh active energy medium voltage	**123,16**
High voltage	**Current prices**
Active energy	67,33
Excise (2.00 BGN/ MWh)	2,00
Commitment to society	36,83
access electricity network	1,17
Transmission of electricity through electricity network	7,36

Price for 1 MWh active energy high voltage	**114,69**

- The price 67.33 BGN/MWh for supply of active energy includes the balance of system component in line with the conducted tender procedure and the contract signed with Most Energy AD, as the validity of the contract is till 31.12.2016.
- The service access to the distribution network for number of days with provided power X kW is calculated with the current price 0.01649 BGN per day.
- In the components Allowance for provided amount of reactive power and Allowance for used amount of reactive power for low and medium voltage no significant change is provided.
- No significant change is provided in the cost for electricity for hired sites.

Regarding it. 5.1. from the protocol about the discussion held on 11.11.2016 we provide the following additional clarifications:

In report No 6 Actuals and forecasted level of the consumption of electricity for the period of the business plan, the average prices increase or decrease.

- **Electricity consumption in terms of quantities and values, low voltage**

The calculations are based on the actuals for 2015 and the annual electricity consumption low voltage to the reporting has been adjusted in compliance with the operational activities of the company and set out in the table below measures to improve energy efficiency.

Project	Service	Tariff	expected impact EE kWh / 2017	expected impact EE kWh / 2018	expected impact EE kWh / 2019	expected impact EE kWh / 2020	expected impact EE kWh / 2021
Expansion of the energy management system for pumping stations	Water supply	HH	-5 000	-11 000	-11 000	-11 000	-11 000
Replacing the booster installations	Water supply	HH	-60 000	-120 000	-170 000	-210 000	-210 000
Extension of SCADA	Water supply	HH	-1 500	-2 000	-2 000	-2 000	-2 000

The total annual effect is stated mainly in WS Sofia but part of it is distributed as percent to WS Bozhurishte and WS Non-potable.

The calculation of consumption for WS Sofia (together with the share of the costs from the separated WS Beli Iskar) low voltage is presented in the following table

	2017 г.	2018 г.	2019 г.	2020 г.	2021 г.
KWh of free market	3 232 412	3 168 814	3 120 996	3 082 742	3 082 742
KWh of hired sites	5 202	5 202	5 202	5 202	5 202
Average price for kWh (BGN)	0,14187	0,14187	0,14187	0,14187	0,14187
Cost for active energy (thousand BGN)	458,58	449,56	442,78	437,35	437,35
Provided power kW	6 771	6 771	6 771	6 771	6 771
Price for access BGN / kW / day	0,01649	0,01649	0,01649	0,01649	0,01649
Days	365	365	365	366	365
Access to the distr. network XX days provided power X kW (thousand BGN)	40,75	40,75	40,75	40,87	40,75
Allowances for used and emitted reactive energy (thousand BGN)	0,12	0,12	0,12	0,12	0,12
Consumption of electricity in the hired sites (thousand BGN)	1,09	1,09	1,09	1,09	1,09
Total kWh	**3 237 613**	**3 174 016**	**3 126 198**	**3 087 944**	**3 087 944**
Total BGN thousand	**500,55**	**491,53**	**484,74**	**479,43**	**479,32**

- Electricity cost in terms of volume and value middle voltage

The calculations are based on the actuals for 2015 and the annual consumption of electricity middle voltage compared to the reported is corrected in compliance with the operational activity of the company and the measures for improvement of energy efficiency and the operation of sites, set in the tables below.

Project	Service	Tariff	expected impact EE kWh / 2017	expected impact EE kWh / 2018	expected impact EE kWh / 2019	expected impact EE kWh / 2020	expected impact EE kWh / 2021
Water-absorbing system in the filter house PWTP Bistritsa	Water supply	MV	35 000	35 000	35 000	35 000	35 000
PS Vladaya	Water supply	MV	0	300 000	291 006	281 952	273 511
Process water Pancharevo	Water supply	MV	56 000	56 000	56 000	56 000	56 000

Project	Service	Tariff	expected impact EE kWh / 2017	expected impact EE kWh / 2018	expected impact EE kWh / 2019	expected impact EE kWh / 2020	expected impact EE kWh / 2021
Development of energy management system in the territory of PWTP Bistritsa	Water supply	MV	-8 000	-16 000	-16 000	-16 000	-16 000
Expansion of the energy management system for pumping stations	Water supply	MV	-5 000	-11 000	-11 000	-11 000	-11 000
SCADA extension	Water supply	MV	-1 000	-1 500	-1 500	-1 500	-1 500
Change based on the water quantity at the inlet of PWTP Pancharevo and PWTP Bistritsa	Water supply	MV	-76 495	-225 358	-263 548	-372 244	-506 585

The total effect in the annual consumption of electricity due to the changes in the water volumes at the inlet of Pancharevo PWTP and Bistritsa PWTP and a kept specific consumption of electricity compared to the reporting 2015 is presented in the following table:

	2015	2017	2018	2019	2020	2021.
Water inlet PWTP Bistritsa + PWTP Pancharevo (m3)	121 763 339	116 027 889	105 573 553	101 009 854	96 567 220	92 414 415
Consumed electricity PWTP Bistritsa + PWTP Pancharevo (kWh)	1 108 809	1 032 314	883 451	845 261	736 565	602 224
Change of the consumed electricity compared to the reporting 2015 (kWh)		-76 495	-225 358	-263 548	-372 244	-506 585

The total annual effect from the change in the consumed electricity compared to the reporting 2015 is stated mainly in WS Sofia but part of it is distributed as percent to WS Bozhurishte and WS Non-potable.

The cost for middle voltage is calculated as follows:

Consumption of electricity for new assets	2017 г.	2018 г.	2019 г.	2020 г.	2021 г.
KWh of free market	87 028	373 935	365 334	356 675	348 602
Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316

Cost for active energy (thousand BGN)	10.72	46.05	44.99	43.93	42.93
Provided power kW	0	96	96	96	96
Price for access BGN / kW / day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to the distr. network XX days provided power X kW (thousand BGN)	0.00	0.58	0.58	0.58	0.58
Allowances for used and supplied reactive energy (thousand BGN)					
Total BGN thousand	**10.72**	**46.63**	**45.57**	**44.51**	**43.51**
Power consumption of existing objects	**2017 г.**	**2018 г.**	**2019 г.**	**2020 г.**	**2021 г.**
KWh of free market	1 499 161	1 342 927	1 306 405	1 202 452	1 073 974
Average price per kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
Cost for active energy (thousand BGN)	184.64	165.39	160.90	148.09	132.27
Provided power kW	6 838	6 838	6 838	6 838	6838
Price Access BGN / kW / day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to the distr. network XX days provided power X kW (thousand BGN)	41.16	41.16	41.16	41.27	41.16
Allowances for used and output reactive energy (thousand BGN)	5.10	5.10	5.10	5.10	5.10
Total BGN thousand	**230.89**	**211.65**	**207.15**	**194.46**	**178.53**
Total kWh MV	**1 586 190**	**1 716 863**	**1 671 739**	**1 559 128**	**1 422 576**
Total thousand BGN Medium voltage	**241.61**	**258.28**	**252.72**	**238.97**	**222.04**

- Electricity cost in terms of volume and value high voltage

Regarding Water supply service in this BP an optimization is made of the announcement of the cost for electricity as part of the cost of Internal Maintenance of Vehicles Dept. (which by tradition is reported to Kubratovo WWTP due to the physical location of the department close to the site), and already is distributed as percent in its capacity as supporting activity for Water supply to customers, Sewerage, Wastewater Treatment Service of WS Sofia, WS Bozhurishte and WS Non-potable and Non-regulated business.

The consumption for the period 2017-2021 is based on the reporting 2015. The increase volume of purchased electricity for 2017 and 2018 is due to the lower volume of generated electricity from the CHP for internal consumption due to planned repairs of the CHP.

In the calculation of the cost for the purchased electricity is applied the valid at the date of preparation of the BP price– 114.69 BGN/MVHR.

Year	Totally consumed energy by Internal Maintenance of vehicles Dept. for WS Sofia supply (kWh)	Purchased energy (kWh)	Produced energy by the CHP for internal use (kWh)	Purchased energy (k BGN)
2015	37 855	2 077	35 778	0.25
2017	37 855	2 473	35 382	0.28
2018	37 855	3 220	34 635	0.37
2019	37 855	2 077	35 778	0.24
2020	37 855	2 077	35 778	0.24
2021	37 855	2 077	35 778	0.24

In this version of the BP 2017- is reflected the correction provided additional information described in the response as per it. 8 of a letter of EWRC B-17-00-8/26.07.2016, as follows:

Changes in the cost for electricity low, middle and high voltage for WS Sofia, *Water supply* activity are presented in report 12.1 *Costs-increase and decrease* as follows:

- In columns „Increase (additional costs)“ – the additional costs for middle voltage due to the operation of new assets and additional costs for purchased energy high voltage due to plant repairs of the cogeneration in 2017 and 2018

Project	Average	2017	2018	2019	2020	2021
Costs for the operation of new assets	KWh	87 028	373 935	365 334	356 675	348 602
	Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
	Cost for active energy (thousand BGN)	10.72	46.05	44.99	43.93	42.93
	Provided capacity, KVHR		96	96	96	96
	Price for access, BGN/kW/day	0.01649	0.01649	0.01649	0.01649	0.01649
	Days	365	365	365	366	365
	Access to distribution network for XX days provided power X kWh (thousand BGN)	0.00	0.58	0.58	0.58	0.58
	Total kWh medium voltage	**87 028**	**373 935**	**365 334**	**356 675**	**348 602**
	Total thousand BGN medium voltage	**10.72**	**46.63**	**45.57**	**44.51**	**43.51**
Project	**High voltage**	**2017**	**2018**	**2019**	**2020**	**2021**
Repair of cogenerators	kWh	396	1 143			
	Average price for kWh (BGN)	0.11469	0.11469	0.11469	0.11469	0.11469
	Cost for active energy	0.05	0.13	0.00	0.00	0.00

	(thousand BGN)					
	Total kWh High voltage	**396**	**1 143**	**0**	**0**	**0**
	Total k BGN High voltage	**0.05**	**0.13**	**0.00**	**0.00**	**0.00**
	Total kWh	**87 424**	**375 078**	**365 334**	**356 675**	**348 602**
	Total k BGN	**10.76**	**46.76**	**45.57**	**44.51**	**43.51**

- In columns „Reduction (efficiency)“– the impact from the change of the costs compared to 2015 due to lower prices valid as at the date of preparation of the BP and the set energy efficiency

Costs for electricity for technological needs for water supply for WS Sofia - Total:						
Year	**2015**	**2017**	**2018**	**2019**	**2020**	**2021**
WS Sofia – actuals 2015	900.46	737.97	745.70	733.23	714.15	697.11
Distributed cost from WS Beli Iskar in accordance with article15 from the Instructions on prices	6.12	4.48	4.48	4.48	4.48	4.48
Cost (k BGN)	906.59	742.44	750.18	737.70	718.63	701.59
Costs for electricity for technological needs – difference compared to 2015 (k BGN)						
Year	**2015**	**2017**	**2018**	**2019**	**2020**	**2021**
Costs in column "Increase (additional costs)"		10.76	46.76	45.57	44.51	43.51
Effect in column "Reduction (efficiency)"		-174.91	-203.17	-214.46	-232.46	-248.51
Total difference compared to 2015		-164.14	-156.41	-168.88	-187.96	-205.00

- **Additional costs for electricity, generated by the cogeneration installation**
- In other costs for materials for the period of BP 2017-2021 on line 1.7.2. in Reports 12 Costs and 12.1 Costs increased and reduced is specified the additional cost for electricity, generated by the CHP for internal consumption for ancillary activity *Internal Maintenance of vehicles, referred to WS Bozhurishte*

The cost is calculated by cost price in compliance with the preferential price of electricity, generated by indirect use of the energy from the domestic wastewater as per Decision of EWRC Ц-18/20.06.2011 and Ц-18/28.06.2012. Included are only the operating costs 47.39 BGN/MVHR and the costs for depreciation and amortization 35.47 BGN/MVHR without rate of return on capital.

Year	**Annual quantity of green energy, directly used for the needs of Internal Maintenance of Cars Department, distributed for activity of WS Sofia Supply in MWh**	**Rate according to EWRC decision**	**Sum in BGN**

2017	35	82.86	2 932
2018	35	82.86	2 870
2019	36	82.86	2 965
2020	36	82.86	2 965
2021	36	82.86	2 965

- **The rest of the costs for materials for the period of the BP 2017 - 2021 for potable water supply are estimated without changing their book value for 2015**

4.1.2 Cost for hired services

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

In this version of BP 2017-2021 a correction was made described in the response as per it. 12.1.10 in a letter from the EWRC B-17-44-25/18.08.2016 as follows:

Regarding water supply for WS Main (WS Sofia) from *NEC* EAD - *Yazoviri I Kaskadi* in the initially filed business plan, the cost for 2017-2021 is made equal to the accounting cost for 2015. In terms of the cash flow, the monetary expenditures amounts to BGN 101,223.84 without VAT a month as evident from the chronological list of the accounting system below:

Date of registration	Document No / Date	Debit account	Analytical account	Credit Account	Analytical account	Sum
31.07.2016	6/39808/31.07.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84
10.02.2016	6/35441/10.02.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84
29.02.2016	6/36093/29.02.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84
31.03.2016	6/36879/31.03.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84
30.04.2016	6/37725/30.04.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84
31.05.2016	6/38386/31.05.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84
30.06.2016	6/39058/30.06.2016	601	10000;OVERHEADS;1;WS Sofia ;07;WATER INLET WS OTHER SUPPLIER	401/11	18;NEC EAD YAZOVIRI I KASKADI ;6000001311;31.07.2016	101 223,84

The monthly cost of BGN 101,223.84 or BGN 1,214,686.08 per annual corresponds to the last signed agreement between the parties, which has been valid in 2016 as well. The reason for the lower accounting cost in 2015 is due to the accrued inflation adjustments for past periods, which once they were not taken into consideration in the additional agreement, were reversed in 2015 and net from these adjustments and under payment documents and in terms of cash flow, the annual cost for 2015 amounts to BGN 1,214,686.08, which is confirmed also by the enclosed excerpt from the accounting system Appendix cost NEC EAD – Yazoviri I Kaskadi 2015 on the grounds of payment under invoices and paid VAT over the service for 2015. Respectively the estimated cost for the years 2017-2021 is adjusted to 1,214,686.08 BGN in compliance with it.17.4. of the Instruction to the Ordinance for regulation of the prices of the WSS services, by excluding the adjustments in 2015 for past periods. Upon regulatory change of the delivery price of NEC EAD Yazoviri I Kaskadi company for the service water supply, SV is available for discussion of a different forecasting regarding this cost.

4.1.3 Cost for remuneration and securities

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

4.1.4 Other costs

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

4.1.5 The forecasted future costs included in the coefficient Qp for execution of new activities and / or operation of new assets.

The costs for operation of new assets for *Potable water supply* service are for electricity middle voltage of the sites presented in the following table:

Project	SERVICE	TARIFF	Expected effect EE kWh / 2017	Expected effect EE kWh / 2018	Expected effect EE kWh / 2019	Expected effect EE kWh / 2020	Expected effect EE kWh / 2021
Water absorbing system in Filter House in PWTP Bistritsa	Water supply	CH	35 000	35 000	35 000	35 000	35 000
PS Vladaya	Water supply	CH	0	300 000	291 006	281 952	273 511
Process water Pancharevo	Water supply	CH	56 000	56 000	56 000	56 000	56 000

The cost is calculated on the basis of the valid as at the date of preparation of the BP average price for middle voltage. The cost for PS Vladaya is calculated at assumption for 100 KVHR supplied power.

In this version of the BP 2017-2021 is reflected the correction and provided additional information described in the response as per it. 7 of a letter of EWRC B-17-00-8/26.07.2016, as follows:

Calculation for the water absorbing system in the Filter Building in Bistritsa PWTP

	2017	2018	2019	2020	2021
KWh on the free market	35 000	35 000	35 000	35 000	35 000
Average price for kWh (BGN)	0,12316	0,12316	0,12316	0,12316	0,12316
Cost for active energy (k BGN)	4,31	4,31	4,31	4,31	4,31
Supplied capacity, kWh	0	0	0	0	0
Price for access, BGN /kWh/day	0,01649	0,01649	0,01649	0,01649	0,01649

Access to distribution network for XX days supplied capacity X kWh (k BGN)	0,000	0,000	0,000	0,000	0,000
Total k BGN	**4,31**	**4,31**	**4,31**	**4,31**	**4,31**

Calculation for PS Vladaya

	2017	2018	2019	2020	2021
KWh on the free market		300 000	291 006	281 952	273 511
Average price for kWh (BGN)		0,12316	0,12316	0,12316	0,12316
Cost for active energy (k BGN)		36,95	35,84	34,73	33,69
Supplied capacity, kWh		100	100	100	100
Days		365	365	366	365
Price for access, BGN /kWh/day		0,01649	0,01649	0,01649	0,01649
Access to distribution network for XX days supplied capacity X kWh (k BGN)		0,602	0,602	0,602	0,602
Total k BGN		**37,55**	**36,44**	**35,33**	**34,29**

Calculation for Process Water Pancharevo

	2017	2018	2019	2020	2021
KWh on the free market	56 000	56 000	56 000	56 000	56 000
Average price for kWh (BGN)	0,12316	0,12316	0,12316	0,12316	0,12316
Cost for active energy (k BGN)	6,90	6,90	6,90	6,90	6,90
Supplied capacity, kWh	0	0	0	0	0
Price for access, BGN /kWh/day	0,01649	0,01649	0,01649	0,01649	0,01649
Days	365	365	365	366	365
Access to distribution network for XX days supplied capacity X kWh (k BGN)	0,000	0,000	0,000	0,000	0,000
Total k BGN	**6,90**	**6,90**	**6,90**	**6,90**	**6,90**

Additional cost, including in coefficient Qp for operation of new assets	2017 k BGN	2018 k BGN	2019 k BGN	2020 k BGN	2021 k BGN
Water absorbing system in the filter house of Bistritsa PWTP	4.31	4.31	4.31	4.31	4.31
PS Vladaya	0.00	37.55	36.44	35.33	34.29
Process Water Pancharevo	6.90	6.90	6.90	6.90	6.90
Total for water supply:	11.21	48.76	47.65	46.54	45.50

The additional total costs for water supply from the table above is distributed respectively between water systems in accordance with the methodology, described in the Appendix to BP 2017-2021 “Accounting system” – current condition:

Separation by water supply systems	2017 k BGN	2018 k BGN	2019 k BGN	2020 k BGN	2021 k BGN
WS Sofia - water supply	10.72	46.63	45.57	44.51	43.51
WS Bozhurishte – water supply	0.00	0.01	0.01	0.01	0.01
WS Non-potable – water supply	0.49	2.11	2.07	2.02	1.97
Total for water supply:	11.21	48.76	47.65	46.54	45.50

The distribution is made as follows:

Separation by water supply systems	2017 k BGN	2018 k BGN	2019 k BGN	2020 k BGN	2021 k BGN
Total for water supply:	11.21	48.76	47.65	46.54	45.50
Separation for Non-potable:					
4.34%	0.49	2.11	2.07	2.02	1.97
WS Sofia and WS Bozhurishte:	10.72	46.64	45.58	44.52	43.52
Separation for Bozhurishte:					
0.028%	0.00	0.01	0.01	0.01	0.01
For WS Sofia:	10.72	46.63	45.57	44.51	43.51

Water absorbing system in the Filter Building in Bistritsa PWTP	2017 k BGN	2018 k BGN	2019 k BGN	2020 k BGN	2021 k BGN
Total for water supply:	4.31	4.31	4.31	4.31	4.31
Separation for Non-potable:					
4.34%	0.19	0.19	0.19	0.19	0.19
WS Sofia and WS Bozhurishte:	4.12	4.12	4.12	4.12	4.12
Separation for Bozhurishte:					
0.028%	0.001	0.001	0.001	0.001	0.001
For WS Sofia:	4.12	4.12	4.12	4.12	4.12

PS Vladaya	2017 k BGN	2018 k BGN	2019 k BGN	2020 k BGN	2021 k BGN
Total for water supply:	0.00	37.55	36.44	35.33	34.29
Separation for non-potable:					
4.34%	0.00	1.63	1.58	1.53	1.49
WS Sofia and WS Bozhurishte:	0.00	35.92	34.86	33.80	32.80
Separation for Bozhurishte					
0.028%	0.00	0.01	0.01	0.01	0.01
For WS Sofia:	0.00	35.91	34.85	33.79	32.79
Process Water Pancharevo	2017 k BGN	2018 k BGN	2019 k BGN	2020 k BGN	2021 k BGN

Total for water supply:	6.90	6.90	6.90	6.90	6.90
Separation for Non-potable:					
4.34%	0.30	0.30	0.30	0.30	0.30
WS Sofia and WS Bozhurishte:	6.60	6.60	6.60	6.60	6.60
***Separation for Bozhurishte*:**					
0.028%	0.002	0.002	0.002	0.002	0.002
For WS Sofia:	6.60	6.60	6.60	6.60	6.60

4.2. ANALYSIS OF THE COSTS BY ITEMS FOR SEWERAGE SERVICE

4.2.1. Costs for materials

- **Electricity for technological needs**

The estimated cost for electricity for technological needs for *Sewerage* service for the period of BP 2017-2021 is:

Year	2015	2017	2018	2019	2020	2021
Expense (k BGN)	64,34	55,83	56,10	55,77	55,80	55,77

The changes in the costs for electricity for technological needs compared to the reporting 2015 are due mainly to the prices valid at the date of preparation of the business plan, described in detail in it. 4.1. of the document and the volume of the electricity high voltage generated for internal consumption

- **Costs of electricity in terms of volume and value low voltage**

The calculations are based on the actuals for 2015

	2017	2018	2019	2020	2021
kWh at free market	69 429	69 429	69 429	69 429	69 429
Average price for kWh	0,14187	0,14187	0,14187	0,14187	0,14187
Cost for active energy (thousand BGN)	9,85	9,85	9,85	9,85	9,85
Provided power, kWh	53	53	53	53	53
Days	365	365	365	366	365
Price for access BGN/kWh/day	0,01649	0,01649	0,01649	0,01649	0,01649
Access to distribution network for XX days provided power X kWh (thousand BGN)	0,32	0,32	0,32	0,32	0,32
Total thousands BGN	**10,17**	**10,17**	**10,17**	**10,17**	**10,17**

- **Costs of electricity in terms of volume and value middle voltage**

The calculations are based on the actuals for 2015

	2017	2018	2019	2020	2021
kWh at free market	279 824	279 824	279 824	279 824	279 824

Average price for kWh (BGN)	0,12316	0,12316	0,12316	0,12316	0,12316
Cost for active energy (thousand BGN)	34,46	34,46	34,46	34,46	34,46
Provided power, kWh	1 500	1 500	1 500	1 500	1500
Price for access BGN/kWh/day	0,01649	0,01649	0,01649	0,01649	0,01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kWh (thousand BGN)	9,03	9,03	9,03	9,05	9,03
Allowances for consumed and output reactive energy (thousand BGN)	1,52	1,52	1,52	1,52	1,52
Total thousand BGN	**45,01**	**45,01**	**45,01**	**45,03**	**45,01**

- **Costs of electricity in terms of volume and value high voltage**

Regarding Sewerage service in this BP an optimization is made of the announcement of the cost for electricity as part of the cost of Internal Maintenance of Vehicles Dept. (which by tradition is reported to Kubratovo WWTP due to the physical location of the department close to the site), and already is distributed as percent in its capacity as supporting activity for Water supply to customers, Sewerage, Wastewater Treatment Service of WS Sofia, WS Bozhurishte and WS Non-potable and Non-regulated business.

The consumption for the period 2017-2021 is based on the reporting 2015. The increase volume of purchased electricity for 2017 and 2018 is due to the lower volume of generated electricity from the CHP for internal consumption due to planned repairs of the CHP.

In the calculation of the cost for the purchased electricity is applied the valid at the date of preparation of the BP price– 114.69 BGN/MVHR.

The total cost for high voltage for Sewerage service consists of the consumption of SPS Benkovski and the percent distribution of Ancillary activity as follows:

Year	Total consumption in kWh for Sewerage service (kWh)	Purchased energy (kWh)	Produced energy by the CHP for internal use (kWh)	Purchased energy (k BGN)
2015	82 524	5 210	77 314	0,63
2017	82 524	5 751	76 773	0,66
2018	82 524	8 077	74 447	0,93
2019	82 524	5 210	77 314	0,60
2020	82 524	5 210	77 314	0,60
2021	82 524	5 210	77 314	0,60

The consumption for the needs of SPS Benkovski is as follows:

Year	Total consumption in kWh for SPS Benkovski	Purchased energy (kWh)	Produced energy by the CHP for internal use (kWh)	Purchased energy (K BGN)
2015	79 020	5 018	74 002	0,60
2017	79 020	5 522	73 498	0,63
2018	79 020	7 779	71 241	0,89
2019	79 020	5 018	74 002	0,58
2020	79 020	5 018	74 002	0,58
2021	79 020	5 018	74 002	0,58

The distributed cost from ancillary activity is as follows:

Year	Internal maintenance of cars Department for WS Sofia sewerage	Purchased energy (kWh)	Produced energy by the CHP for internal use (kWh)	Purchased energy (k BGN)
2015	3 504	192	3 312	0,02
2017	3 504	229	3 276	0,03
2018	3 504	298	3 206	0,03
2019	3 504	192	3 312	0,02
2020	3 504	192	3 312	0,02
2021	3 504	192	3 312	0,02

In this version of BP 2017-2021 is included also the correction in the provided additional information stated in the response as per it. 8 of a letter of the EWRC No B-17-00-8/26.07.2016 as follows:

The changes in the cost for electricity low, middle and high voltage for WS Sofia, *Sewerage* activity are presented in report 12.1 *Costs-increase and decrease* as follows:

- In columns “Increase (additional costs)” – the additional costs for purchased energy high voltage due to planned repairs of the cogeneration installation in 2017 and 2018.

Project	High voltage	2017	2018
Repair of cogenerators	KWh	541	2 867
	Average price for kWh (BGN)	0.11469	0.11469
	Cost for active energy (k BGN)	0.06	0.33
	Total kWh High voltage	**541**	**2 867**
	Total k BGN High voltage	**0.06**	**0.33**

In columns „Reduction (efficiency)“– is stated the impact from the change of the costs as compared to 2015 due to the lower valid prices as at the date of preparation of the Business Plan:

Costs for electricity for technological needs- Total:						
Year	2015	2017	2018	2019	2020	2021
Cost (k BGN)	64.34	55.83	56.10	55.77	55.80	55.77

Costs for electricity for technological needs – difference compared to 2015 (k BGN)						
Year	2015	2017	2018	2019	2020	2021
Costs in column „Increase (additional costs)“		0.06	0.33	0.00	0.00	0.00
Effect in column „Reduction (efficiency)“		-8.57	-8.57	-8.57	-8.54	-8.57
Total difference compared to 2015		-8.51	-8.24	-8.57	-8.54	-8.57

- **Additional Costs for electricity generated by the CHP**

In other costs for materials for the period of BP 2017-2021 on line 1.7.2. in Reports 12 Costs and 12.1 Costs increased and reduced is specified the additional cost for electricity, generated by the CHP for internal consumption for SPS Benkovski and *Internal Maintenance of Vehicles Dept., referred to Sewerage service* of WS Sofia.

The cost is calculated by cost price in compliance with the preferential price of electricity, generated by indirect use of the energy from the domestic wastewater as per Decision of EWRC Ц-18/20.06.2011 and Ц-18/28.06.2012. Included are only the operating costs 47.39 BGN/MVHR and the costs for depreciation and amortization 35.47 BGN/MVHR without rate of return on capital.

	Annual quantity of green energy, directly used for the needs of SPS Benkovski and the distributed expense Internal maintenance of cars for WS Sofia sewerage in MWh	Rate according to decision of EWRC	Sum in BGN
2017	77	82.86	6 361
2018	74	82.86	6 169
2019	77	82.86	6 406
2020	77	82.86	6 406
2021	77	82.86	6 406

- **The rest of the costs for materials for the period of the BP 2017 - 2021 for Potable water supply are estimated without changing their book value for 2015**

4.2.2. Costs for hired services

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

4.2.3. Costs for remunerations and securities

The remuneration expenses contain the expenses for the current company staff and the ones for future employees that are needed because of the nature of the business and upcoming projects. The calculations for remuneration and insurance also contain planned amount for annual increase of the percentage for professional qualification and length of service, as well as an increase of 3% based on the conducted salary surveys of the labor market during the last years and salary forecasts of leading companies.

The company has a Collective Bargaining Agreement. All conditions in it concerning the remuneration are included in the calculations of the remuneration expenses. According to these conditions, the company is obliged to observe the minimum levels of salary for different staff categories that are bounded by the minimum monthly salary in the state, as well as to make an increase of 1% per year of service for professional qualification. The minimum levels are calculated based on medium-term budget forecasts for monthly salary which is 460 BGN for the years 2016 and 2017 and fro the next 3 years it will increase with 20 BGN. An increase of 1% is planned for the insurance expenses for the period 2019 – 2021.

The remuneration expenses are allocated by services and systems according to the instructions and the methodology of Unified System for Regulatory Reporting, as well as the instructions for the preparation of Business Plan 2017 -2021. The first step is referring the direct remuneration expenses to the relevant service, which is based on a cost center. After that the remuneration expenses for auxiliary and administrative staff are being allocated. These expenses are divided between regulated and non-regulated business activities and between the regulated services in proportion to the share of the direct expenses for each service towards the common sum of the direct expenses form which the amortization cost is taken. The proportional service shares are used, applied to the Report for 2015.

4.2.4. Other costs

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

4.2.5. The forecasted future costs, included in the coefficient Qp for implementation of new activities and/or operation of new assets

As at the date of preparation of BP 2017-2021 for Sewerage future costs are not envisaged, included in the coefficient Qp for implementation of new activities and / or operation of new assets.

4.3 ANALYSIS OF THE COSTS BY ELEMENTS FOR WASTEWATER TREATMENT SERVICE

4.3.1. Costs for materials

- **Cost for the materials for disinfection**

In compliance with the response as per it. 12.1.3 in a letter of EWRC No B-17-44-25 / 18.08.2016 the Costs for sludge liming stated in the initial version of the BP to other *Costs for materials* are referred to Costs for materials for disinfection

The cost for sludge liming is adjusted compared to its level for 2015 of 125 k BGN to the total amount of 225 k BGN for each of the years of the BP 2017-2021 as per the following justification:

Period	Quantity (ton)	Expense BGN	Average price BGN/ton	Quantity at inlet WWTP m3	Sludge ton d.s.	Specific consumption ton/ton d.s.
Actuals 2015	888	125 011	140,80	138 760 699	28 453	0,031204
Period	**Quantity (ton)**	**Expense BGN**	**Average price BGN/ton**	**Quantity at inlet WWTP m3**	**Sludge ton d.s.**	**Specific consumption ton/ton d.s.**
Estimate 2017	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2018	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2019	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2020	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2021	1 600	225 229	140,80	138 792 699	29 000	0,055160

The sludge generated and treated in the processes of wastewater treatment of settlements usually contain a big number of pathogens, viruses etc, which pose a real danger at storage, transportation and utilization of sludge. The sludge, which afterwards is utilized in agriculture, should meet strict normative criteria, both regarding the content of heavy metals etc. toxic and poisonous substances, as well as regarding the pathogens. Worldwide proven as the most effective and expedient for disinfection of sludge in an urban WWTP is the mixing of quicklime. The method allows increasing very quickly sludge temperature to more than 60 degrees and at the same time increasing pH to more than 10-11 for a long period of time, which first leads to the destruction of most of the harmful microorganisms and in the long term to continuous inhibiting and not allowing development of harmful microorganisms.

It has been found (Carl Bro S / A, 1997), that in order to raise the pH in sludge from 7 to 12.5, 1.7 moles of (OH) are needed for 1 g TS, so that the buffer capacity of proteins in sludge is neutralized. Since 56 mg CaO produce two moles (OH), 50 mg CaO are needed for 1 g TS. For sludge with TS 20-30%, 1-1,5% CaO are needed for increase of pH to 12.5. At this dose neutralization of CO2 is not achieved and the production of organic acids. Therefore, a higher dose of usually more than 2% of CaO is needed. It is best to use dosages of 3-8% CaO, to ensure maintenance of a high pH for a sufficiently long period (several months).

One of the main reasons for CO2 generation and the subsequent decrease of pH is the biological activity in sludge. Due to inefficient mixing and the lack of a buffer capacity at dose 2% CaO, some parts of the sludge are unstable meaning that pH is lower than 12, thus there is microbial activity and generation of CO2. As result of it

very quickly pH goes down to 8-9 within a few weeks. The same happens with the dose of 4% CaO, despite at a slower pace (a few months). For both doses unpleasant odor is smelled. Sufficient time (more than three months), of stable pH about 12,5 might be ensured by doses in the interval 3-8%.

The installed equipment in SWWTP is designed for maximum dose of 20% lime dry substance at maximum capacity of the filter presses which dewater sludge to 20-25% content of dry substance

The cost for sludge liming, generated in the process of wastewater treatment, are estimated at the assumption for low growth in the volume of the generated sludge compared to the generated in 2015 – 28,453 tons dry substance to 29,000 tons dry substance and at a dose of 5.5%. When liming using smaller doses the sludge should stay in the drying beds for more than 12 months for natural stabilization. SWWTP does not have the capacity to store temporarily sludge for more than 8 months.

The costs reported for the activity in 2015 are lower compared to the forecasted for 2017-2021 due to the technical problems that occurred at the operation of the installation for sludge liming.

- Costs for materials for coagulants

The costs for coagulants for *Wastewater treatment* service for the period of the BP 20217-2021 are calculated on the grounds of the following prerequisites:

- Valid as at the date of preparation of the BP price for ferrous trichloride
- Estimated water volumes at the inlet of Kubratovo WWTP
- The specific consumption of coagulant for m3 of water for the reporting 2015

Detailed calculation of the costs for coagulants is presented in the following table:

Period	Quantity (kg)	Expense BGN	Average price BGN/kg	Quantities at inlet WWTP Kubratovo m3	Specific consumption kg/m3
Report 2015	3 913 541	965 926	0.25	138 760 699	0.028204
Period	**Quantity (kg)**	**Expense BGN**	**Average price BGN/kg**	**Quantities at inlet WWTP Kubratovo m3**	**Specific expense kg/m3**
Prognosis 2017	3 913 541	1 301 996	0.33	138 760 699	0.028204
Prognosis 2018	3 913 541	1 301 996	0.33	138 760 699	0.028204
Prognosis 2019	3 913 541	1 301 996	0.33	138 760 699	0.028204
Prognosis 2020	3 913 541	1 301 996	0.33	138 760 699	0.028204
Prognosis 2021	3 913 541	1 301 996	0.33	138 760 699	0.028204

The average cost of 0.33 BGN / kg corresponds to the valid price under the contract for supply at the time of preparation of this Business Plan.

The total effect from the circumstances described above is increase of the costs for coagulant as compared to the reporting 2015, which effect is recorded in columns "Increase (additional costs)" of report *12.1 Cost – increase and decrease*

2017	2018	2019	2020	(thousand BGN) 2021
336	336	336	336	336

- Costs for materials – flocculants

The costs for flocculants for Wastewater treatment service for the period of the BP 2017-2021 are calculated on the basis of the following prerequisites:

- Valid as at the date of preparation of the BP price for flocculant.
- Forecasted sludge volume
- The specific consumption of flocculant per a tone of dry substance for the reporting 2015

Detailed description of the costs for flocculants is presented in the following table:

Period	Quantity (kg)	Expense BGN	Average price BGN/kg	Quantities at inlet WWTP m3	Sludge ton d.s.	Specific expense kg/ton d.s.
Report 2015	164 750	694 531	4.22	138 760 699	28 453	5.790251
Period	**Quantity (kg)**	**Expense BGN**	**Average price BGN/kg**	**Quantities at inlet WWTP m3**	**Sludge ton d.s.**	**Specific expense g/ton d.s.**
Prognosis 2017	167 917	634 727	3.78	138 792 699	29 000	5.790251
Prognosis 2018	167 917	634 727	3.78	138 792 699	29 000	5.790251
Prognosis 2019	167 917	634 727	3.78	138 792 699	29 000	5.790251
Prognosis 2020	167 917	634 727	3.78	138 792 699	29 000	5.790251
Prognosis 2021	167 917	634 727	3.78	138 792 699	29 000	5.790251

***** *Note:* The volumes at the inlet of WWTP beside the volumes above 138 760 699 m3 include also the volumes at the inlet of Voinyagovtsi WWTP – 32,000 m3. The average price of 3.78 BGN/kg corresponds to the valid price under a contract for delivery at the time of preparation of this BP.

In the columns "Increase (additional costs) of report 12.1 *Costs – increase and decreases* are stated the values resulting from the estimated increase of the processed sludge in WWTP Kubratovo due to the operation of Voynyagovtsi WWTP and the extension of the sewerage network

Period	Quantity (kg)	Expense BGN	Average price BGN/kg	Quantities at inlet WWTP m3	Sludge ton d.s.	Specific expense kg/ ton d.s.
Prognosis 2017	3 167	11 972	3.78	32 000	547	5.790251
Prognosis 2018	3 167	11 972	3.78	32 000	547	5.790251
Prognosis 2019	3 167	11 972	3.78	32 000	547	5.790251
Prognosis 2020	3 167	11 972	3.78	32 000	547	5.790251
Prognosis 2021	3 167	11 972	3.78	32 000	547	5.790251

The values in the column “Reduction (efficiency)” of report 12.1 *Costs – increase and decrease* reflect the price impact from the average price of the flocculant depending on the reporting year.

2017	2018	2019	2020	2021
-72	-72	-72	-72	-72

- **Electricity for technological needs**

The estimated consumption of electricity for technological needs for the service Wastewater treatment for the period of the BP 2017-2021 is

Year	2015	2017	2018	2019	2020	2021
Expense (thousand BGN)	104.96	169.78	212.97	134.66	134.65	134.64

Besides the stated below effects in terms of volume, the changes in the cost for electricity for technological needs compared to the reporting 2015 are due to the valid prices as at the date of the preparation of the Business Plan, which are described in detail in it. 4.1. of this document

- **Costs of electricity in terms of volume and value low voltage**

The calculations are based on the actuals for 2015 г. The formation of the cost for WS Sofia low voltage is presented in the following table:

	2017	2018	2019	2020	2021
kWh at free market	740	740	740	740	740
Average price for kWh (BGN)	0,14187	0,14187	0,14187	0,14187	0,14187
Cost for active energy (thousand BGN)	0,10	0,10	0,10	0,10	0,10
Provided power, kWh	30	30	30	30	30
Price for access BGN/kWh/day	0,01649	0,01649	0,01649	0,01649	0,01649
Days	365	365	365	366	365
Access to distribution network for XX days distributed power X kWh (Thousand BGN)	0,18	0,18	0,18	0,18	0,18

Total thousand BGN	**0,29**	**0,29**	**0,29**	**0,29**	**0,29**

- **Costs of electricity in terms of volume and value middle voltage**

In 2015 the consumption of electricity middle voltage for the activity is zero but in 2016 it is expected to commission a new site:

Project	SERVICE	TARIFF	Expected effect EE kWh / 2017	Expected effect EE kWh / 2018	Expected effect EE kWh / 2019	Expected effect EE kWh / 2020	Expected effect EE kWh / 2021
Local WWTP Voynagovtsi	Treatment	CH	350 000	350 000	350 000	350 000	350 000

The effect from the volume of electricity necessary for the operation of Voynyagovtsi local WWTP is stated in columns “Increase (additional costs)” of Report 12.1. *Costs – increase and reduction*

	2017	2018	2019	2020	2021
kWh at free market	350 000	350 000	350 000	350 000	350 000
Average price for kWh (BGN)	0,12316	0,12316	0,12316	0,12316	0,12316
Cost for active energy (thousand BGN)	43,11	43,11	43,11	43,11	43,11
Provided power, kWh	50	50	50	50	50
Price for access BGN/kWh/day	0,01649	0,01649	0,01649	0,01649	0,01649
Days	365	365	365	366	365
Access to distribution network XX days distributed power X kWh (thousand BGN)	0,30	0,30	0,30	0,30	0,30
Total thousand BGN	**43,41**	**43,41**	**43,41**	**43,41**	**43,41**

- **Costs of electricity in terms of volume and value high voltage**

The calculations are based on the actuals for 2015 and the annual consumption of electricity high voltage as compared to the reporting is corrected in compliance with the operating activity of the company and the measures for improvement of energy efficiency set in the table below:

Project	SERVICE	TARIFF	Expected effect EE kWh / 2017	Expected effect EE kWh / 2018	Expected effect EE kWh / 2019	Expected effect EE kWh / 2020	Expected effect EE kWh / 2021
Development of SCADA for energy management	Treatment	HV	-5 000	-10 000	-12 000	-14 000	-16 000

WWTP							
Gradual replacement of pump units in WWTP	Treatment	HV	-5 000	-10 000	-15 000	-15 000	-15 000
Overhaul of power and illuminating installations in WWTP	Treatment	HV	-20 000	-40 000	-40 000	-40 000	-40 000
Replacement of pumps for wastewater with PLC	Treatment	HV	0	-17 000	-35 000	-35 000	-35 000

In the calculation of the cost for the purchased electricity high voltage is applied the price valid as at the date of preparation of BP - 114.69 BGN/MVHR.

Year	General consumption in kWh for needs of WWTP Kubratovo	from which purchased energy kWh	Expense in BGN	From which directly used for needs of WWTP Kubratovo	Consumed energy, separately from WWTP Kubratovo	Produced energy by CHP for internal use	Sold green energy	Total produced green energy by the CHP
2015	17 861 659	797 486	104 627	17 064 173	620 956	17 685 129	2 256 731	19 941 860
2017	17 831 659	1 099 391	126 089	16 732 268	600 295	17 332 563	2 211 672	19 544 235
2018	17 784 659	1 475 940	169 276	16 308 719	576 755	16 885 474	2 254 309	19 139 783
2019	17 759 659	793 146	90 966	16 966 514	620 956	17 587 470	2 354 390	19 941 860
2020	17 757 659	793 060	90 956	16 964 599	620 956	17 585 555	2 356 305	19 941 860
2021	17 755 659	792 975	90 946	16 962 684	620 956	17 583 640	2 358 220	19 941 860

The increased volume of purchased energy for 2017-2018 is due to the lower volume of generated energy from the CHP for internal consumption due to planned repairs.

In this version of BP 2017-2021 is reflected the correction and provided additional information, described in it. 8 of a letter of the EWRC B-17-00-8/26.07.2016 as follows:

The changes to the cost of electricity low, middle and high voltage for WS Sofia *Wastewater treatment* are presented in report 12.1 *Costs – increase and decrease* as follows:

- In columns “Increase (additional costs)” – the additional costs for middle voltage due to the operation of local WWTP Voynegovtsi and the additional costs for purchased energy high voltage due to planned repairs of the cogeneration installation in 2017 and 2017, which costs are explicitly stated as per it. 5.1. from the protocol of for the discussion held on 11.11.2016

Project	Middle voltage	2017	2018	2019	2020	2021
Costs for operation of new assets	KWh	350 000	350 000	350 000	350 000	350 000
	Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
	Cost for active energy (k BGN)	43.11	43.11	43.11	43.11	43.11
	Supplied capacity, kWh	50	50	50	50	50
	Price for access, BGN /kWh/day	0.01649	0.01649	0.01649	0.01649	0.01649
	Days	365	365	365	366	365
	Access to distribution network for XX days supplied capacity X kWh (k BGN)	0.30	0.30	0.30	0.30	0.30
	Total kWh Middle voltage	**350 000**	**350 000**	**350 000**	**350 000**	**350 000**
	Total k BGN Middle voltage	**43.41**	**43.41**	**43.41**	**43.41**	**43.41**
Project	**High voltage**	**2017**	**2018**	**2019**	**2020**	**2021**
Repair of cogenerators	KWh	303 181	681 338			
	Average price for kWh (BGN)	0.11469	0.11469	0.11469	0.11469	0.11469
	Cost for active energy (k BGN)	34.77	78.14	0.00	0.00	0.00
	Total kWh High voltage	**303 181**	**681 338**	**0**	**0**	**0**
	Total k BGN High voltage	**34.77**	**78.14**	**0.00**	**0.00**	**0.00**
	Total kWh	**653 181**	**1 031 338**	**350 000**	**350 000**	**350 000**
	Total k BGN	**78.18**	**121.55**	**43.41**	**43.41**	**43.41**

- In columns „Reduction (efficiency)“ is reflected the impact from the changes of the expenses as compared to 2015 due to the lower current prices as at the date of preparation of the BP and the set energy efficiency:

Costs for electricity for technological needs- Total:						
Year	**2015**	**2017**	**2018**	**2019**	**2020**	**2021**
Cost (k BGN)	104.96	169.78	212.97	134.66	134.65	134.64
Costs for electricity for technological needs- difference compared to 2015 (k BGN)						
Year	**2015**	**2017**	**2018**	**2019**	**2020**	**2021**
Costs in column „Increase (additional costs)“		78.18	121.55	43.41	43.41	43.41
Effect in column „Reduction (efficiency)“		-13.35	-13.54	-13.70	-13.71	-13.72
Total difference compared to 2015		64.83	108.01	29.70	29.70	29.68

- **Other costs for materials**

The cost for sludge liming is corrected compared to its level for 2015 of 125 k BGN to the total amount of 225 k BGN for each of the years of the BP 2017-2021 as per the following justification:

Period	Quantity (ton)	Expense BGN	Average price BGN/ton	Quantity at inlet WWTP m3	Sludge ton d.s.	Specific consumption ton/ton d.s.
Report 2015	888	125 011	140,80	138 760 699	28 453	0,031204
Period	**Quantity (ton)**	**Expense BGN**	**Average price BGN/ton**	**Quantities at inlet WWTP m3**	**Sludge ton d.s.**	**Specific consumption ton/ton d.s.**
Estimate 2017	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2018	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2019	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2020	1 600	225 229	140,80	138 792 699	29 000	0,055160
Estimate 2021	1 600	225 229	140,80	138 792 699	29 000	0,055160

The sludge generated and treated in the processes of wastewater treatment of settlements usually contain a big number of pathogens, viruses etc, which pose a real danger at storage, transportation and utilization of sludge. The sludge, which afterwards is utilized in agriculture, should meet strict normative criteria, both regarding the content of heavy metals etc. toxic and poisonous substances, as well as regarding the pathogens. Worldwide proven as the most effective and expedient for disinfection of sludge in an urban WWTP is the mixing of quicklime. The method allows increasing very quickly sludge temperature to more than 60 degrees and at the same time increasing pH to more than 10-11 for a long period of time, which first leads to the destruction of most of the harmful microorganisms and in the long term to continuous inhibiting and not allowing development of harmful microorganisms.

It has been found (Carl Bro S / A, 1997), that in order to raise the pH in sludge from 7 to 12.5, 1.7 moles of (OH) are needed for 1 g TS, so that the buffer capacity of proteins in sludge is neutralized. Since 56 mg CaO produce two moles (OH), 50 mg CaO are needed for 1 g TS. For sludge with TS 20-30%, 1-1,5% CaO are needed for increase of pH to 12.5. At this dose neutralization of CO2 is not achieved and the production of organic acids. Therefore, a higher dose of usually more than 2% of CaO is needed. It is best to use dosages of 3-8% CaO, to ensure maintenance of a high pH for a sufficiently long period (several months).

One of the main reasons for CO_2 generation and the subsequent decrease of pH is the biological activity in sludge. Due to inefficient mixing and the lack of a buffer capacity at dose 2% CaO, some parts of the sludge are unstable meaning that pH is lower than 12, thus there is microbial activity and generation of CO_2. As result of it very quickly pH goes down to 8-9 within a few weeks. The same happens with the dose of 4% CaO, despite at a slower pace (a few months). For both doses unpleasant odor is smelled. Sufficient time (more than three months), of stable pH about 12,5 might be ensured by doses in the interval 3-8%.

The installed equipment in SWWTP is designed for maximum dose of 20% lime dry substance at maximum capacity of the filter presses which dewater sludge to 20-25% content of dry substance

The cost for sludge liming, generated in the process of wastewater treatment, are estimated at the assumption for low growth in the volume of the generated sludge compared to the generated in 2015 – 28,453 tons dry substance to 29,000 tons dry substance and at a dose of 5.5%. When liming using smaller doses the sludge should stay in the drying beds for more than 12 months for natural stabilization. SWWTP does not have the capacity to store temporarily sludge for more than 8 months.

The costs reported for the activity in 2015 are lower compared to the forecasted for 2017-2021 due to the technical problems that occurred at the operation of the installation for sludge liming.

- **Additional Costs for electricity generated by the CHP**

In other costs for materials for the period of BP 2017-2021 on line 1.7.2. in Reports 12 Costs and 12.1 Costs increased and reduced is specified the additional cost for electricity, generated by the CHP for internal consumption in Kubratovo PWTP and *Maintenance of vehicles, referred to Wastewater treatment* of WS Sofia.

The cost is calculated by cost price in compliance with the preferential price of electricity, generated by indirect use of the energy from the domestic wastewater as per Decision of EWRC Ц-18/20.06.2011 and Ц-18/28.06.2012. Included are only the operating costs 47.39 BGN/MVHR and the costs for depreciation and amortization 35.47 BGN/MVHR without rate of return on capital.

	Annually, quantity of green energy , directly used for the needs of WWTP Kubratovo and distributed expense Internal maintenance of cars Department for WS Sofia treatment in MWh	Rate according to decision of EWRC	Sum in BGN
2015	17 064	82.86	1 413 937
2017	16 732	82.86	1 386 436
2018	16 309	82.86	1 351 340
2019	16 967	82.86	1 405 845
2020	16 965	82.86	1 405 687
2021	16 963	82.86	1 405 528

- **The rest of the costs for materials for the period of the BP 2017 - 2021 for potable water supply are estimated without changing their book value for 2015**

4.3.2. Costs for hired services

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

2015	
Total volume of transported sludge in agriculture, t	Volumes of transported sludge by a contractor
95 994	62 123
Relative share of transported volumes by a contractor	64,72%

2015	
Total utilized tones of sludge dry substance	Utilized tones of sludge dry substance, by a contractor with share 64.72%
23 998	15 530,49
Costs for sludge transportation in 2015 in BGN.	318 057
Price under contract ton/kilometer in BGN.	0,23
Average costs in BGN per ton of dry substance	20,48

Ref No	Y 2017 and every next year	
1	Total utilized tones of sludge dry substance	Utilized tones of sludge dry substance, by contractor
2	29000,0	18 767,57
3	Price under contract per ton/kilometer, BGN	0,35
4	Increase in new contract price compared to the previous one (0.35 BGN/t/km to 0.23 BGN/t/km)	52,17%
5	Average costs in BGN per ton of dry substance with a new contract price	31,16
6	**Total cost in BGN per ton of dry substance (6 = 1*5)**	**584 881,81**

4.3.3. Costs for remunerations and securities

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

4.3.4 Other costs

As per the provided justification in Section 4 above and the sections Analysis of the cost effectiveness in Part II – Technical Part.

4.3.5. The forecasted future costs, included in the coefficient Qp for implementation of new activities and/or operation of new assets

The costs for operation of new assets for Wastewater treatment service are for electricity middle voltage for the sites, presented in the following table:

Project	SERVICE	TARIFF	Expected effect EE kWh / 2017	Expected effect EE kWh / 2018	Expected effect EE kWh / 2019	Expected effect EE kWh / 2020	Expected effect EE kWh / 2021
LWWTP Voynyagovtsi	treatment	MV	350 000	350 000	350 000	350 000	350 000

The cost is calculated on the basis of the average price middle voltage valid as at the date of preparation of BP. The cost for Voynyagovtsi local WWTP is calculated at assumption for 50 KVWH supplied capacity.

	2017	2018	2019	2020	2021
Total k BGN	**43,41**	**43,41**	**43,41**	**43,41**	**43,41**

Detailed calculation of the costs is presents in it.4.3.1 Costs for Materials.

In this version of BP 2017-2021 is reflected the correction in the electronic model in report 12.1 *Costs – increase and decrease* in accordance with conducted discussion on 11.11.2016 as per it 5 - for the wastewater treatment service, the envisaged increase of the costs for 2017-2018 related to the repair of the cogeneration installation will be provided as an additional future cost in report No 12.1

Project	High voltage	2017	2018
Repair of cogenerators	KWh	303 181	681 338
	Average price for kWh (BGN)	0.11469	0.11469
	Cost for active energy (k BGN)	34.77	78.14

4.4 ANALYSIS OF THE COSTS BY ITEMS FOR WATER SUPPLY TO ANOTHER WSS OPERATOR SERVICE

WS Beli Iskar

As described in it. 4.1. of this document as per the principles of the Uniform Regulatory Reporting System to the main WS Sofia are referred 80.48% from the costs of WS Beli Iskar. In WS Beli Iskar are referred the other 19.52% calculated as per the billed volumes as follows:

Description	Measure	2015	2016	2017	2018	2019	2020	2021
Water supply for customers								
Total water volumes at the system inlet A3/Q4	m3/year	**8 633 851**	**8 616 159**	**9 237 818**	**9 348 769**	**9 042 769**	**8 886 769**	**8 730 769**
Abstracted raw water from surface water sources	m3/year	44 247 516	46 000 000	46 000 000	46 000 000	46 000 000	46 000 000	46 000 000

Abstracted raw water from underground water sources	m3/year	0	0	0	0	0	0	0
Supplied raw water from other WSS company/provider	m3/year	0	0	0	0	0	0	0
Supplied treated water from other WSS company/provider	m3/year	0	0	0	0	0	0	0
Sold raw water to other WSS company/provider	m3/year	35 613 665	37 383 841	36 762 182	36 651 231	36 957 231	37 113 231	37 269 231
Water losses in supply of raw water to other WSS operator	m3/year	0	0	0	0	0	0	0
Provided treated water to other WSS operator	m3/year	0	0	0	0	0	0	0
Water losses in supply of potable water to other WSS operator	m3/year	0	0	0	0	0	0	0
Share for WS Sofia		80,49%	81,27%	79,92%	79,68%	80,34%	80,68%	81,02%
Share for WS Beli Iskar		19,51%	18,73%	20,08%	20,32%	19,66%	19,32%	18,98%
Arithmetic average share for WS Sofia		80,48%						
Arithmetic average share for WS Beli Iskar		19,52%						

After the above percentage distribution, the estimated costs for 2017-2021 amount in total to 380 K BGN

The costs for materials for each of the years of the BP are lowed by 0.40 k BGN as compared to the reporting 2015 due to the calculation of the costs for electricity for technological needs in compliance with the prices valid as at the date of preparation of the BP, described in detail in it. 4.1.1. of this document.

In the following table is presented in detail the calculation of the costs for electricity for technological needs for the part of the direct costs for WS Beli Iskar, which is not referred to the main WS Sofia:

	2017	2018	2019	2020	2021
kWh on the free market	7 223	7 223	7 223	7 223	7 223
Average price for kWh (BGN.)	0.14187	0.14187	0.14187	0.14187	0.14187
Cost for active energy (thousand BGN)	1.02	1.02	1.02	1.02	1.02
Provided power, kWh	10	10	10	10	10
Price for access, BGN/kWh/day	0.01649	0.01649	0.01649	0.01649	0.01649

Days	365	365	365	366	365
Access to distribution network for XX days provided power X kWh (thousand BGN)	0.06	0.06	0.06	0.06	0.06
Total kWh	**7 223**	**7 223**	**7 223**	**7 223**	**7 223**
Total thousand BGN	**1.09**	**1.09**	**1.09**	**1.09**	**1.09**

WS Bozhurishte

At the forecast of the costs for WS Bozhurishte for 2017-2021 is executed a correction of the costs for 2017-2021 on line 7.7.2. of the model of WS Bozhurishte, which reflects the higher estimated billed volumes for WS Bozhurishte as compared to the values used in the report for 2015 in compliance with the Uniform Accounting System (UAS).

For 2015 as per the UAS when separating the costs for WS Bozhurishte a percentage ratio is used on the basis of the volumes from the preceding year as per it. 7 of the **Rules to the uniform chart of accounts for regulatory purposes of the WSS operators.**

	2014 (m^3)
Billed m3 for Bozhurishte in 2014	45 425
Total volume of potable water at the outlet of PWTP for supply for WS Sofia and WS Bozhurishte for 2014:	162 471 428
Rate for separation of WS Bozhurishte:	**0.028%**

The estimated billed volumes for 2017-2021 are a lot higher as follows (in m3):

2017	2018	2019	2020	2021
148 588	145 531	145 531	145 531	145 531

And in 2015 are reported 145,531 m3.

Taking into consideration the estimates for the water volumes at the outlet of PWTP for supply for WS Sofia and WS Bozhurishte for each of the years is recalculated the percent for separation for WS Bozhurishte, as follows:

	2017	2018	2019	2020	2021
Billed m3 for Bozhurishte	148 588	145 531	145 531	145 531	145 531
Total volume of potable water at the outlet of PWTP for supply for WS Sofia and WS Bozhurishte	153 924 549	148 258 235	143 942 580	139 549 338	135 497 150
Rate for separation of WS Bozhurishte:	**0.10%**	**0.10%**	**0.10%**	**0.10%**	**0.11%**
Volumes at the inlet of WS Sofia	153 775 962	148 112 704	143 797 049	139 403 807	135 351 619

Volumes at the inlet WS Bozhurishte	148 588	145 531	145 531	145 531	145 531
(k BGN)					
Cost 2015 at a rate report UAS 2015	16.14	16.14	16.14	16.14	16.14
Depreciation 2015 report UAS	3.14	3.14	3.14	3.14	3.14
Cost without depreciation according to UAS	**13.00**	**13.00**	**13.00**	**13.00**	**13.00**
Rate for separation in report 2015	0.028%	0.028%	0.028%	0.028%	0.028%
Adjusted rate for separation	0.097%	0.098%	0.101%	0.104%	0.107%
Relation between the two rates	3.45	3.51	3.62	3.73	3.84
Corrected cost without depreciations (in compliance with volumes under UAS)	44.89	45.64	47.01	48.49	49.94
Nominal net correction in BGN = Corrected cost without depreciations with excluded cost without depreciations, already reported under UAS	**31.89**	**32.64**	**34.01**	**35.49**	**36.94**

The calculated net nominal correction is added to the model of WS Bozhurishte and respectively taken on a separate line in the model for WS Sofia (by which the cost for WS Sofia is reduced) to ensure compliance with the estimation of the costs on the basis of the share of the water volumes as per the Uniform Regulatory Reporting System.

- **Costs for materials**

The changes of the costs for materials for disinfection and for coagulants for the period of BP 2017-2021 as compared to the reporting 2015 is due to the distribution of some of the costs for WS Sofia to WS Bozhurishte. In it. 4.1.1 Costs for materials for the Water supply service are described the reasons for change of the costs

- **Cost for electricity for technological needs**

The estimated cost for electricity for technological needs for WS Bozhurishte for the period of BP 2017-2021 is:

Year	2015	2017	2018	2019	2020	2021

Cost (k BGN)	0.25	0.21	0.21	0.21	0.20	0.19

The changes in the cost for electricity for technological needs compared to the reporting 2015 are due to:

- the valid process as at the date of preparation of the BP, described in detail in it. 4.1. of this document
- the referring of some of the set measures for improvement of energy efficiency and the costs for operation of new assets to from the main WS Sofia to WS Bozhurishte
- The volume of generated for external consumption electricity high voltage

- **Costs of electricity in terms of volume and value low voltage**

The calculation of the costs for electricity low voltage is presented in the following table:

	2017	2018	2019	2020	2021
kWh on the free market	896	878	865	854	854
kWh hired sites	1	1	1	1	1
Average price for kWh (BGN)	0.14187	0.14187	0.14187	0.14187	0.14187
Value for active energy (thousand BGN)	0.13	0.12	0.12	0.12	0.12
Provided power, kW	2	2	2	2	2
Price for access, BGN/kWh/day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kW (thousand BGN)	0.01	0.01	0.01	0.01	0.01
Allowances for used and provided reactive energy (thousand BGN)	0.00	0.00	0.00	0.00	0.00
Costs for electricity of hired sites (thousand BGN)	0.00	0.00	0.00	0.00	0.00
Total kWh	**897**	**879**	**866**	**855**	**855**
Total thousand BGN	**0.14**	**0.14**	**0.13**	**0.13**	**0.13**

- **Costs of electricity in terms of volume and value middle voltage**

The calculation of the costs for electricity middle voltage is presented in the following table:

Costs for electricity for new assets, separated from the main WS Sofia	2017	2018	2019	2020	2021
kWh on the free market	24	105	102	100	97
Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
Cost for active energy (thousand BGN)	0.00	0.01	0.01	0.01	0.01
Provided power, kWh	0.00	0.03	0.03	0.03	0.03
Price for access, BGN/kWh/day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kWh (thousand BGN)	0.00	0.00	0.00	0.00	0.00

Allowances for used and provided reactive energy (thousand BGN)					
Total thousand BGN.	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**
Cost for electricity for existing sites	**2017**	**2018**	**2019**	**2020**	**2021**
kWh on the free market	419	376	365	336	300
Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
Cost for active energy (thousand BGN)	0.05	0.05	0.04	0.04	0.04
Provided capacity, KVHR	2	2	2	2	2
Price for access, BGN/kW/day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kWh (thousand BGN)	0.01	0.01	0.01	0.01	0.01
Allowances for used and provided reactive energy (thousand BGN)	0.00	0.00	0.00	0.00	0.00
Total thousand BGN.	**0.06**	**0.06**	**0.06**	**0.05**	**0.05**
Total kWh medium voltage	**444**	**480**	**468**	**436**	**398**
Total thousand BGN medium voltage	**0.07**	**0.07**	**0.07**	**0.07**	**0.06**

- **Costs of electricity in terms of volume and value high voltage**

In this BP an optimization is made of the announcement of the cost for electricity as part of the cost, which by tradition is reported to Kubratovo WWTP due to proximity to the site. The cost and the consumption of the Supporting activity Internal Maintenance of Vehicles is distributed as percent to Water supply to customers, Sewerage, Wastewater Treatment Services of WS Sofia, WS Bozhurishte and WS Non-potable and Non-regulated business.

The consumption for high voltage for WS Bozhurishte consists of the percentage distribution of Supporting Activity.

Year	Department Internal maintenance of vehicles for WS Bozhurishte	Purchased energy (kWh)	Produced energy by the CHP for internal use (kWh)	Purchased energy (k BGN)
2015	10.6	0.6	10.0	0.0001
2017	10.6	0.7	9.9	0.0001
2018	10.6	0.9	9.7	0.0001
2019	10.6	0.6	10.0	0.0001
2020	10.6	0.6	10.0	0.0001
2021	10.6	0.6	10.0	0.0001

In this version of the BP 2017-2021 is reflected the correction and provided additional information described in the response as per it 8 of EWRC B-17-00-8/26.07.2016.

In the expense stated above for construction of the cogeneration installation is:

Project	High voltage	2017	2018
Repair of cogenerators	KWh	0.11	0.32
	Average price for kWh (BGN)	0.11469	0.11469
	Cost for active energy (k BGN)	0.0000127	0.0000367
	Total kWh High voltage	**0.11**	**0.32**
	Total k BGN High voltage	**0.0000127**	**0.0000367**

In column “Increase (additional costs)” are stated the effects from the referring of some of the costs for operations of new assets from the main WS Sofia to WS Bozhurishte and the effect form the purchased volume of electricity for technological needs high voltage due to planned repair of the cogeneration installation

In column “Reduction (efficiency)” are stated the effects from the prices valid as at the date of preparation of the Business Plan and the referring of some of the stated measures for improvement of the energy efficiency from the main WS Sofia to WS Bozhurishte.

Detailed calculation of the costs stated in column “Increase (additional costs)” and “Reduction (efficiency)” in report 12.1 *Costs – increase and reduction* is presented in it. 4.1.1 Costs for materials.

- **Additional costs for electricity, generated by the cogeneration installation**

In other costs for materials for the period of BP 2017-2021 on line 1.7.2. in Reports 12 Costs and 12.1 Costs increased and reduced is specified the additional cost for electricity, generated by the CHP for internal consumption for ancillary activity *Internal Maintenance of vehicles, referred to WS Bozhurishte*

The cost is calculated by cost price in compliance with the preferential price of electricity, generated by indirect use of the energy from the domestic wastewater as per Decision of EWRC Ц-18/20.06.2011 and Ц-18/28.06.2012. Included are only the operating costs 47.39 BGN/MVHR and the costs for depreciation and amortization 35.47 BGN/MVHR without rate of return on capital.

	Annual volume of green energy, directly used for the needs of Internal maintenance of vehicles Department, separated for WS Bozhurishte in MWh	Rate according to Decision of EWRC	Amount BGN
2017	0.01	82.86	1
2018	0.01	82.86	1
2019	0.01	82.86	1
2020	0.01	82.86	1
2021	0.01	82.86	1

- **The rest of the costs for materials for the period of the BP 2017 - 2021 for WS Bozhurishte are transferred from the reporting 2015**

All other costs except for the costs for depreciation and amortization and the costs for remuneration and securities and the costs for use of water sites are made equal to the reported values for 2015

.

4.5. ANALYSIS OF THE COSTS BY ITEMS FOR NON-POTABLE WATER SUPPLY SERVICE

- **Costs for materials**

The costs for materials over the period of BP 2017-2021 for Non-potable water supply are made equal to the actuals in 2015 except for the costs for electricity for technological needs and the additional cost for electricity generated by the cogeneration installation.

The estimated cost for electricity for technological needs for *Non-potable water supply* service for the period of BP 2017-2021 is:

Year	2015	2017	2018	2019	2020	2021
Cost (k BGN)	41.19	33.56	33.91	33.35	32.48	31.71

The changes in the cost for electricity for technological needs compared to the reporting 2015 are due to:

- the valid process as at the date of preparation of the BP, described in detail in it. 4.1. of this document
- the referring of some of the set measures for improvement of energy efficiency and the costs for operation of new assets to the separated WS Non-potable water
- The volume of generated for external consumption electricity high voltage

In this version of BP 2017-2021 is stated the correction and the provided additional information, stated in response as per it. 8 of a letter of the EWRC B-17-00-8/26.07.2016

In column “Increase (additional costs)” are stated the effects from the referring of some of the costs for operations of new assets from the main WS Sofia to WS Non-potable and the effect form the purchased volume of electricity for technological needs high voltage due to planned repair of the cogeneration installation.

In column “Reduction (efficiency)” are stated the effects from the prices valid as at the date of preparation of the Business Plan and the referring of some of the stated measures for improvement of the energy efficiency from the main WS Sofia to WS Non-potable.

- **Costs of electricity in terms of volume and value low voltage**

The calculation of the costs for electricity low voltage is presented in the following table:

	2017	2018	2019	2020	2021
kWh on the free market	145 877	142 992	140 823	139 088	139 088
kWh hired sites	236	236	236	236	236
Average price for kWh (BGN)	0.14187	0.14187	0.14187	0.14187	0.14187
Cost for active energy (thousand BGN)	20.70	20.29	19.98	19.73	19.73
Provided power, kW	306	306	306	306	306
Price for access, BGN/kW/day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kW (thousand BGN)	1.84	1.84	1.84	1.85	1.84
Allowances for used and provided reactive energy (thousand BGN)	0.01	0.01	0.01	0.01	0.01
Cost for electricity for hired sites (thousand BGN)	0.05	0.05	0.05	0.05	0.05
Total kWh	**146 113**	**143 228**	**141 059**	**139 324**	**139 324**
Total k BGN	**22.59**	**22.18**	**21.87**	**21.63**	**21.63**

- **Costs of electricity in terms of volume and value middle voltage**

The calculation of the costs for electricity low voltage is presented in the following table:

Cost for electricity for new assets	2017	2018	2019	2020	2021
kWh on the free market	3 947	16 960	16 570	16 177	15 811
Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
Cost for active energy (thousand BGN)	0.49	2.09	2.04	1.99	1.95
Provided power, kW	0	4	4	4	4
Price for access, BGN/kW/day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kW (thousand BGN)	0.00	0.03	0.03	0.03	0.03
Allowances for used and provided reactive energy (thousand BGN)					
Total thousand BGN	**0.49**	**2.11**	**2.07**	**2.02**	**1.97**
Cost for electricity for existing sites	**2017**	**2018**	**2019**	**2020**	**2021**
kWh on the free market	67 996	60 910	59 253	54 538	48 711
Average price for kWh (BGN)	0.12316	0.12316	0.12316	0.12316	0.12316
Cost for active energy (thousand BGN)	8.37	7.50	7.30	6.72	6.00
Provided power, kW	310	310	310	310	310
Price for access, BGN/kW/day	0.01649	0.01649	0.01649	0.01649	0.01649
Days	365	365	365	366	365
Access to distribution network for XX days provided power X kW (thousand BGN)	1.87	1.87	1.87	1.87	1.87
Allowances for used and provided reactive energy (thousand BGN)	0.23	0.23	0.23	0.23	0.23
Total thousand BGN	**10.47**	**9.60**	**9.40**	**8.82**	**8.10**

Total kWh medium voltage	**71 943**	**77 870**	**75 823**	**70 716**	**64 522**
Total thousand BGN medium voltage	**10.96**	**11.71**	**11.46**	**10.84**	**10.07**

- **Costs of electricity in terms of volume and value high voltage**

Regarding the electricity high voltage in this BP an optimization is made of the announcement of the cost for electricity as part of the cost of Internal Maintenance of Vehicles Dept. (which by tradition is reported to Kubratovo WWTP due to the physical location of the department close to the site), and already is distributed as percent in its capacity as ancillary activity for Water supply to customers, Sewerage, Wastewater Treatment Service of WS Sofia, WS Bozhurishte and WS Non-potable and Non-regulated business.

The consumption for high voltage for *Non-potable Water supply* service consists of the percent distribution of the consumption for Ancillary activity.

Year	Department Internal maintenance of vehicles for WS non-potable	Purchased energy (kWh)	Produced energy by the CHP for internal use (kWh)	Purchased energy (thousand)
2015	1 717	94	1 623	0,01
2017	1 717	112	1 605	0,01
2018	1 717	146	1 571	0,02
2019	1 717	94	1 623	0,01
2020	1 717	94	1 623	0,01
2021	1 717	94	1 623	0,01

In the expense stated above for repair of the cogeneration installation are

WS Non-potable			
Project	**High voltage**	**2017**	**2018**
Repair of cogenerators	KWh	17.96	51.84
	Average price for kWh (BGN)	0.11469	0.11469
	Cost for active energy (k BGN)	0.00206	0.00595
	Total kWh High voltage	**17.96**	**51.84**
	Total k BGN High voltage	**0.00206**	**0.00595**

- **Additional Costs for electricity generated by the CHP**

In other costs for materials for the period of BP 2017-2021 on line 1.7.2. in Reports 12 Costs and 12.1 Costs increased and reduced is specified the additional cost for electricity, generated by the CHP for internal consumption for ancillary activity *Internal Maintenance of vehicles, referred to Non-potable water supply*

The cost is calculated by cost price in compliance with the preferential price of electricity, generated by indirect use of the energy from the domestic wastewater as per Decision of EWRC Ц-18/20.06.2011 and Ц-18/28.06.2012. Included are only the operating costs 47.39 BGN/MVHR and the costs for depreciation and amortization 35.47 BGN/MVHR without rate of return on capital.

	Annual volume of green energy, directly used for the needs of Internal maintenance of vehicles Department, separated for WS non-potable water in MWh	Rate according to Decision of EWRC	Amount in BGN
2017	2	82,86	133
2018	2	82,86	130
2019	2	82,86	134
2020	2	82,86	134
2021	2	82,86	134

Regarding the **costs for hired services** the reduction in the cost or water supply by a different operator is significant, which cost is recalculated in accordance with a draft decision for change of the delivery prices of Napoitelni Sistemi EAD (http://dker.bg/KAPDOCS/res-draft-napoitelni-sistemi.pdf)

Cost for supply of non-potable water from Napoitelni Sistemi ЕАД								***(k BGN)***
		2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Volumes supplied water		7 361 729	7 800 000	8 350 000	6 871 348	6 780 936	6 690 523	6 600 111
Current price under contract	0,043							
Costs by years		317	335	359	295	292	288	284
Costs with price 0.03 BGN, according draft-decision				251	206	203	201	198

5. SOCIAL PROGRAM

Sofiyska Voda performs a social program in accordance with the Collective Labor Agreement, the Branch Labor Agreement and the regulatory requirements of the Bulgarian legislation, including the Law on Regulation of the Water and Sewerage Services and its ordinances.

Sofiyska Voda is a responsible company to its partners and customers, environment and its employees. The company seeks to establish and maintain excellent working environment, high personal effectiveness, commitment of the employees to company's goals and priorities.

The company pays special attention to the employees' health. There is a policy for safe working practice for all activities, which is being followed. A system is developed

based on the Bulgarian legislation which aims at elimination or mitigation of risks for all customers, employees, society and environment. Health and safety are as important as all other measures taken to ensure the quality of our business activity.

The social program provides different initiatives and benefits to stimulate the employees: vouchers for food and other goods, sports club, money for transportation, additional health insurance, and financial assistance for employees with financial experiences.

6. INTRODUCTION OF A UNIFORM REGULATORY REPORTING SYSTEM (URRS)

As stated below in the part “Schedule for introduction of URRS” as per art. 34, para 7 of the **Ordinance on the prices of the WSS services,** the rules of the URRS, the chart of accounts and the annual financial statements are applied not earlier than the start of the calendar year, following the date of their approval – respectively from the start of 2017

6.1 Used software programs and/ or information systems

For implementation of the regulatory requirement after the filing of BP 2017-2021 the company will specify a working schedule for introduction of URRS. A significant step will be the conduct of meetings with the system integrators in order to ensure one platform and achieve cost efficiency at maximum use of the already installed for the needs of the UAS platform on the basis of the accounting application AJUR.

At the introduction of URRS will be met the principles and the rules of URRS, which will be reflected in the specific software implementation and the internal documentation for implementation of the requirements stated below regarding:

6.2 Approach of distribution, including also the coefficients for distribution of assets, costs and revenues for non-regulated business and between the regulated services
6.3 Principles of reporting of the repair program
6.4 Principles of reporting of the investment program
6.5. Principles of capitalization of the costs
6.6 Principles of reporting of the operating and the capital repairs
6.7 Principles of separation of the costs by activities and by services
6.8 Regulation of the described principles by formal internal rules (instructions)

7. UNRECOGNIZED COSTS – DESCRIPTION AND ANALYSIS

In compliance with Chapter III, Section II, it. 19 from the Instructions for formation of the prices for WSS services, in the recognized costs for the relevant service are not included and are reported as unrecognized in Report *Profit and Loss Account*, the following costs:

- Financial costs –refer to the relevant line of the profit and loss account

- Costs for losses from impairment - refer to the relevant line of the profit and loss account
- Other costs, referred to line „Unrecognized costs“ Report *Profit and Loss Account*, including
- Costs for provisions by virtue of art. 38 and art. 39 of the Corporate Income Tax Act
- Costs or liabilities for reduction of the book value of stocks
- Costs for donation
- Representation expenses and the taxes on them
- Penalties and/or fines, imposed on the state bodies
- Costs for interest rates and penalties related to non-compliance with the signed contracts
- Costs for premiums for additional health insurances of the employees – the cost is reported in reduction of the recognized “Costs for hired services – Costs for insurances“ over the period 2017 - 2021 and respectively in increase of „Unrecognized costs“
- For the purpose of accurate calculation of the financial results of the company, equity and all corresponding to them values, the amount of the regulatory calculated depreciations are corrected to the amount of the recognized for tax and accounting purposes, the difference is reported to unrecognized costs and is stated on the relevant line of the Report Profit And Loss Account.
- Costs for the income tax - refer to the relevant line of the profit and loss account

IV. COMMERCIAL PART

1. ANALYSIS OF THE EXISTING AND ESTIMATED LEVEL OF WSS SERVICES FOR THE REGULATED PERIOD

In the BP 2017-2021 submitted on 30.06.2016 SV submits the following analysis in connection with the expected consumption and the planned billed volumes:

The customer service of the company is one of the main priorities of the executive management of SV. A main part of the above-stated service is the fair, correct and timely invoicing of consumption of the WSS services (water supply, sewerage and treatment of wastewater), provided by SV. In order to be able to fully respond to the expectations of customers and business, the company aims at constantly improving the activities connected with the reading and invoicing of its customers.

The current analysis has the purpose to present what the existing levels of consumption of WSS services were within the regulated period 2009-2015 and to determine the estimated consumption for the next period of Business Plan 2017-2021.

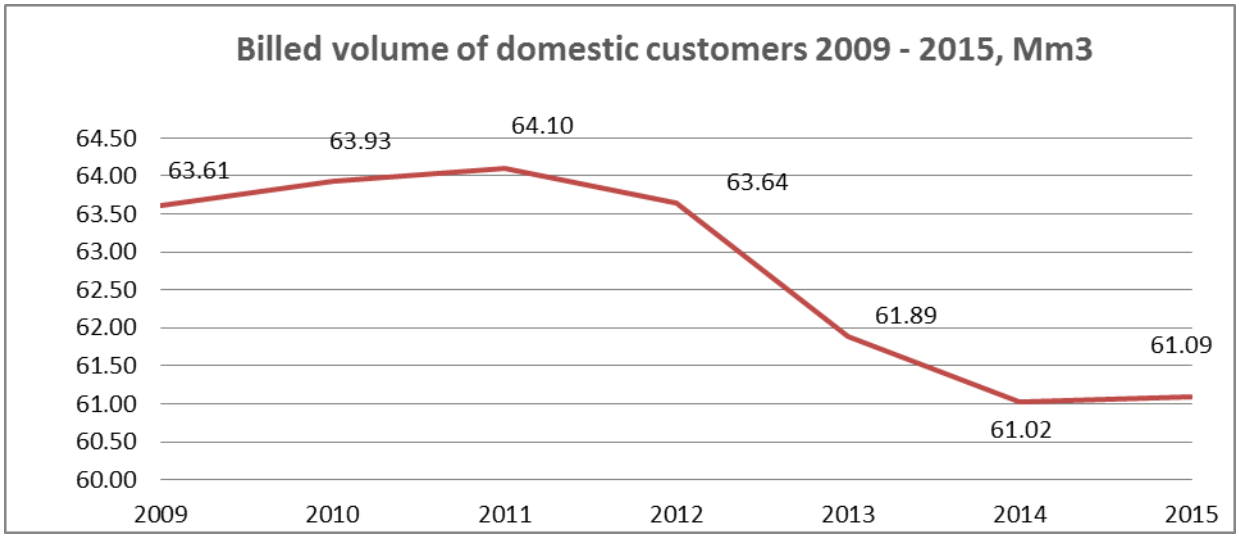
1.1. ANALYSIS OF THE CONSUMPTION OF WSS FOR THE PERIOD 2009-2015 – WATER SUPPLY

1.1.1 Domestic customers

The billed consumption of domestic customers for the reporting period is on average about 77% of the total billed quantity. The annual billed quantities of this type of customers in the period 2009-2015 are presented in the table below:

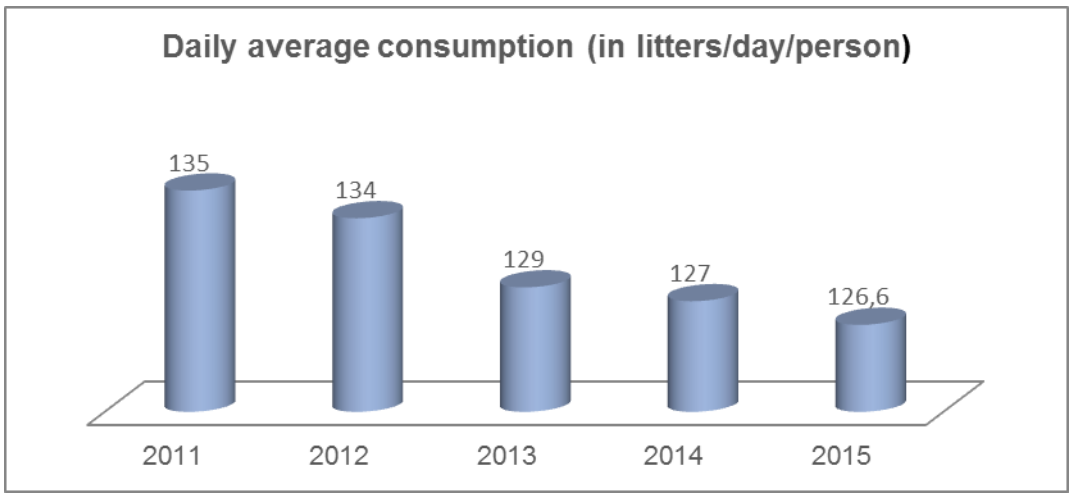
Billed water volumes at WS Sofia	2009 m3	2010 m3	2011 m3	2012 m3	2013 m3	2014 m3	2015 m3
Domestic customers	63 609 976	63 930 108	64 098 164	63 641 478	61 888 908	61 024 351	61 086 283

Since 2011 there is a constant tendency for reduction in billed volumes as presented in the graph below:



The slight increase in 2015 is due to the record hot summer over this period and cannot be considered as significant for the analysis of the trends in the billing of water volumes

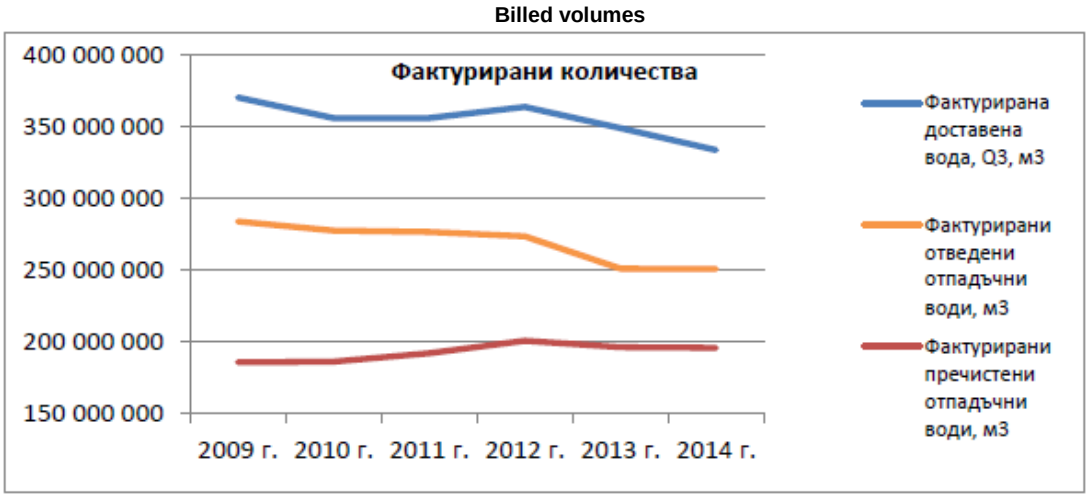
The reduction of the total billed volume of *domestic customers* is related to the reducing trend at the average daily billed volume to a resident (l/day/resident), as evident from the graph below:



On annual base, the daily average billed volume has registered the following reduction with -2% in 2012, with -4% in 2013, -2% in 2014 and -0.15% in 2015.

The tendency for reduction in the annual billed volume is confirmed in the customer survey on customer satisfaction conducted in April 2016 by an external independent company (more information in item 3 from the General Part of the Business Plan). According to the data there, 75% out of the respondents take active measures to reduce the unnecessary consumption to a minimum or replace old water pipes in buildings as in this way they reduce leaks (52% of the same group). This tendency is also connected with the usage of modern sanitary-drinking tap facilities and water consuming household appliances.

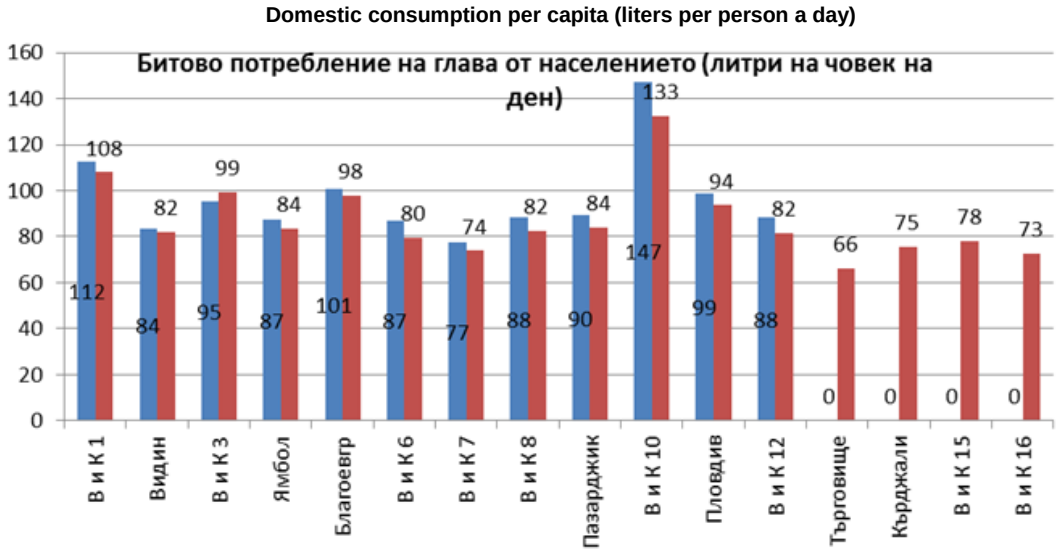
The general tendency for reduction in billed water volumes is also reported in *Comparative Analysis of the WSS Sector* in the Republic of Bulgaria for the period 2009-2014 published by the EWRC and adopted with a decision under item 1 in Protocol No 246/01.12.2015:



blue = billed supplied water,Q3, m^3
yellow = billed drained wastewater, m^3
red = billed treated wastewater, m^3

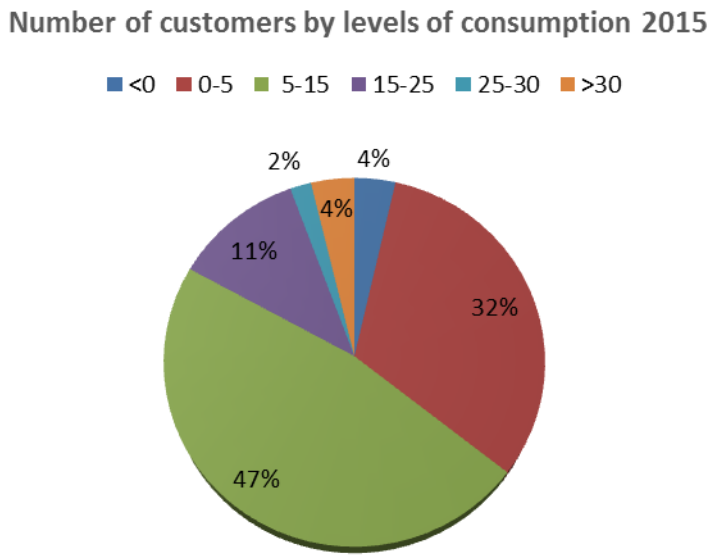
The same tendency has been established also in the report “Process benchmarking of the WSS companies in Bulgaria” for 2014. The comparative analysis covers the period 2013 – 2014 as the average level of the indicators for 2013 is calculated for 12

participants, and for 2014 – for 16 participants. In the graph below, the pillars on the left (in blue) concern 2013, and the one on the right (in red) – for 2014:

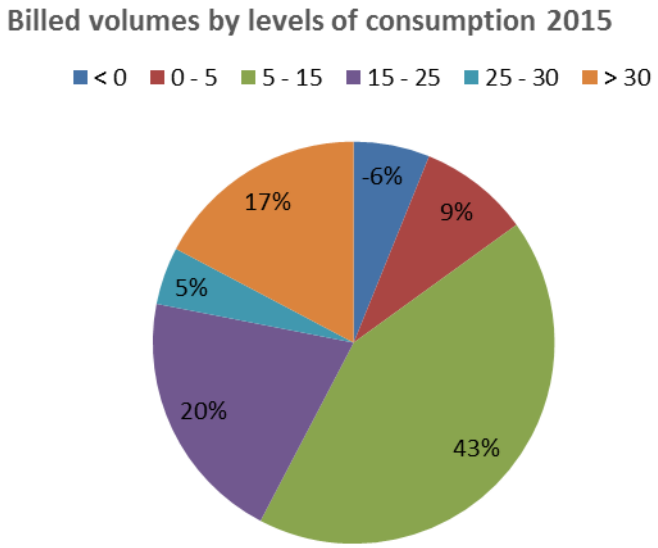


This tendency is connected with the dynamics of the customers from groups with higher consumption to those with lower. The company monthly monitors and analyses the number of the customers from population, distributed into relevant groups by month average consumption: 0-5 m^3, 5-15 m^3, 15-25 m3, 25-30 m^3 and over 30 m^3/month. Monthly monitoring is conducted both for the number of customers that are in the relevant quantitative groups and for the billed volumes distributed among the same groups.

In 2015, 32% of the customers, whose consumption is measured, consumed between 0-5 m^3/month, 47% - between 5-15 m^3/month and 11% - between 15-25 m^3/month:



The allocation of the billed volumes by levels of consumption is presented in the chart below:



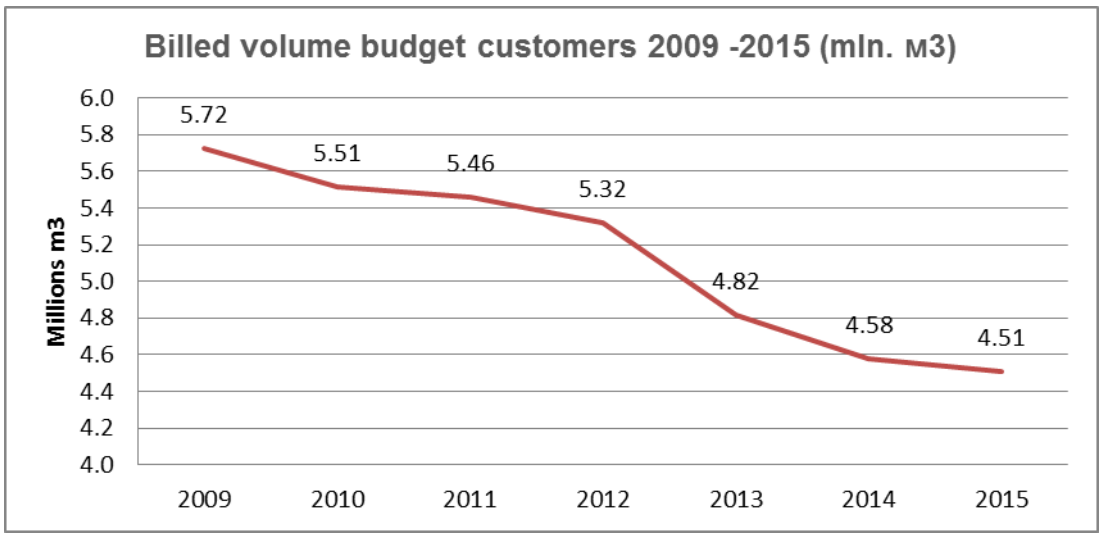
In order to find the reasons for the decreasing consumption during the reported period 2009 – 2015, as in 2013 a decrease in consumption of customers by ***type population*** was registered, the company conducted two studies of the customers' opinion with low pressure of water supply. The first study was conducted among 1 529 customers with average consumption between 0 and 5 м3/ month and the second – among 1 543 customers with consumption between 5 and 15 м3/ month. As a result from the study, the levels of consumption were confirmed and we received information for the main types of consumption of tap water.

1.1.2 Budget and commercial customers

The billed consumption of the *budget customers* occupies on average about 6% out of the billed volumes for the period 2009 – 2015. The annual billed volumes of this type in the reporting period are presented in the following table:

Billed water volumes at WS Sofia	**2009 m³**	**2010 m³**	**2011 m³**	**2012 m³**	**2013 m³**	**2014 m³**	**2015 m³**
Budget consumers and equal to domestic	**5 724 734**	**5 514 981**	**5 458 491**	**5 318 554**	**4 819 529**	**4 579 325**	**4 511 538**

The tendency for decrease in billed water volumes after 2011 is visible for budget customers, as well. The following chart shows this tendency:



With the purpose to find the reasons for decrease in consumption of customers by those type, the company monthly analyses the billed volumes of each customer with a change ±50 m^3 for the relevant month in comparison to the same month from the previous year. A contact with the customer is undertaken and inspections on site as well.

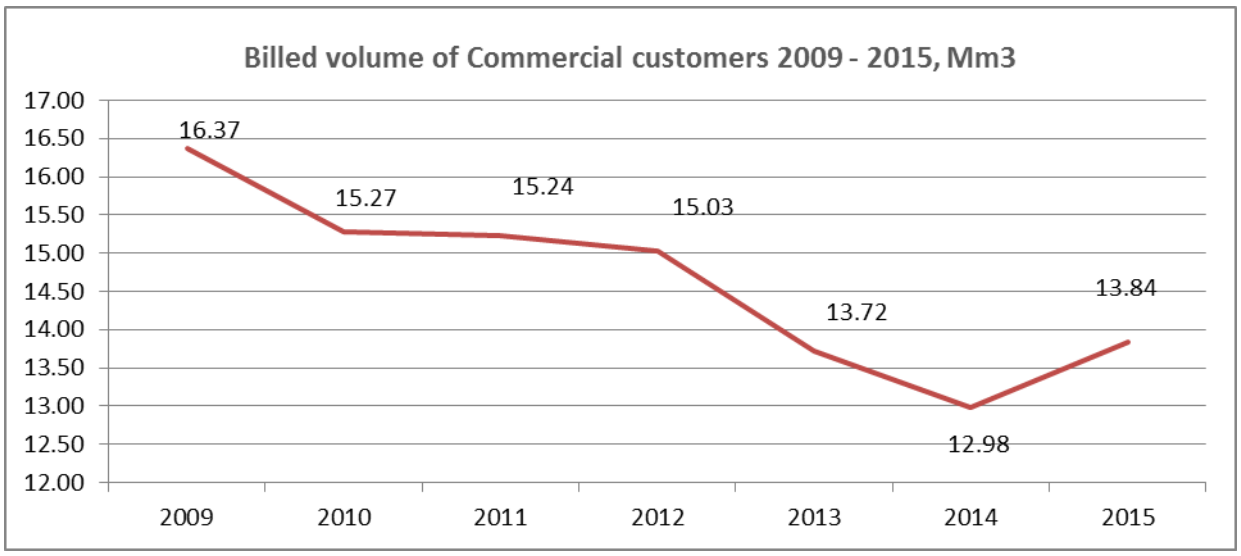
The main reasons in decrease in consumption are the repaired leaks and the repair of internal water supply installations.

The billed consumption of commercial consumers is on average about 17% out of the total billed volume.

The annual billed volumes of this type of customers in the 2009 – 2015 are presented in the table below:

Billed water volumes at WS Sofia	2009 m^3	2010 m^3	2011 m^3	2012 m^3	2013 m^3	2014 m^3	2015 m^3
Commercial	16 368 460	15 272 825	15 235 106	15 028 607	13 724 296	12 976 180	13 836 300

A tendency for decrease is observed after 2011 up to 2014. In 2015 an increase was registered mainly due to considerably higher levels of billed estimated consumption because access to the property for meter reading not provided. The trend of the billed volumes for commercial customers is presented in the graph below:



The tendency for decrease in consumption for commercial customers after 2011 are mainly due to reconstructions and repairs along the internal network, repair of internal leaks, decrease in its production and/or removal to another populated area and increased consumption of water from own water source.

1.1.3 Industrial customers

The annual billed volumes of industrial water for the period 2009-2015 are presented in the table below.

Billed water volumes for WS Sofia	2009 m^3	2010 m^3	2011 m^3	2012 m^3	2013 m^3	2014 m^3	2015 m^3
Industrial	3 809 940	4 434 525	4 867 322	5 388 259	4 674 275	4 359 280	4 449 349

The consumption trend for this category of customers is characterized with extremely low elasticity as 96% of the total consumption is of the biggest consumer – „Toplofikatsia Sofia“ EAD and is directly dependent on its current needs for industrial water, which is also directly dependent on the weather (increased consumption in years with cold winter) and intensive preventive works on the facilities.

1.2. ANALYSIS OF THE CONSUMPTION OF THE WSS SERVICES FOR THE PERIOD 2009-2015 – SEWERAGE

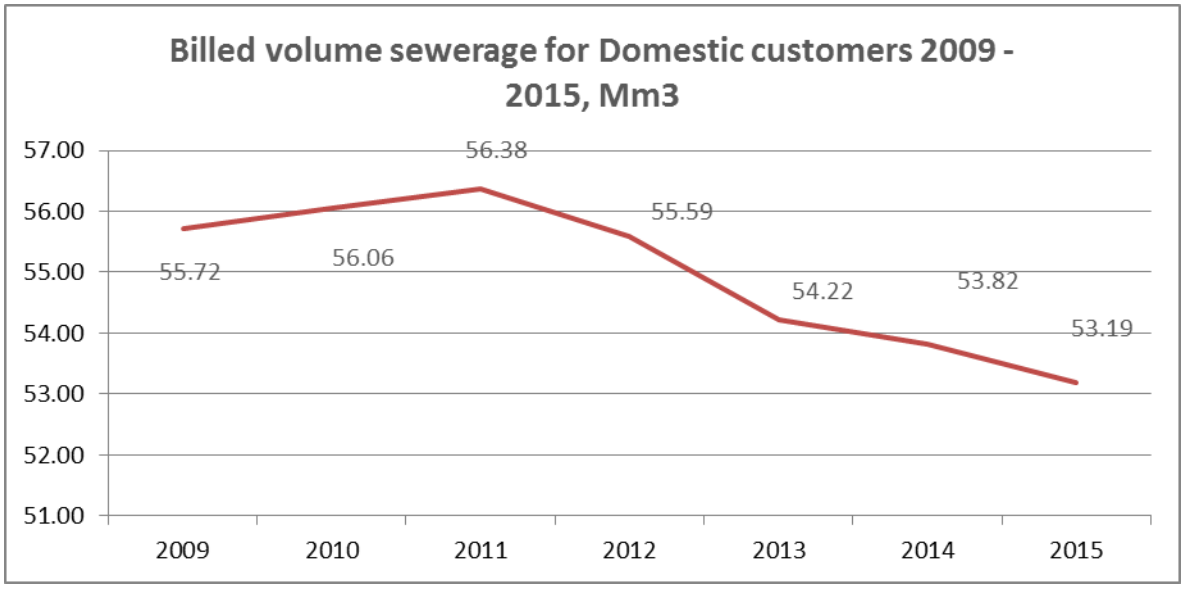
1.2.1 Domestic customers

For the reporting period 2009 – 2015 the following volumes of billed volumes drained wastewater were billed to the customers of population type or the so-called *domestic customers*

Billed volumes of drained wastewater for WS Sofia	2009 m^3	2010 m^3	2011 m^3	2012 m^3	2013 m^3	2014 m^3	2015 m^3

Domestic customers	55 724 866	56 056 157	56 379 786	55 588 150	54 224 822	53 816 680	53 188 870

And here for the sewerage service, as well as in billing of water supply service, there is the same reducing trend of the volumes after 2011.



1.2.2 Budget and commercial customers

The following table shows the billed volumes of drained wastewater of budget customers over the period 2009 – 2015:

Billed volumes waste water discharged WS Sofia	**2009 m3**	**2010 m3**	**2011 m3**	**2012 m3**	**2013 m3**	**2014 m3**	**2015 m3**
Budget customers	**5 285 720**	**5 067 427**	**5 085 812**	**4 963 058**	**4 459 793**	**4 202 671**	**4 161 552**

For this type of customers as well the trend for reduction of the volumes after 2011 remains.

Depending on the degree of pollution, the wastewater of commercial customers is grouped in the following categories

- First level
- Second level
- Third level

The following table presents the billed volumes of drained wastewater from *commercial customers* over the period 2009 – 2015:

Billed volumes of drained wastewater WS Sofia	**2009 m3**	**2010 m3**	**2011 m3**	**2012 m3**	**2013 m3**	**2014 m3**	**2015 m3**
Commercial customers equal to households				5 020 673	8 496 757	8 121 388	8 695 886

Commercial – level of pollution 1 (up 200mg/l)	16 184 124	14 997 839	15 107 312	10 187 536	5 382 282	4 988 265	5 078 095
Commercial – level of pollution 2 (up to 200-600 mg/l.)	770 383	950 499	1 024 851	806 002	715 054	798 474	737 741
Commercial – level of pollution 3 (above 600 mg/l)	404 594	260 092	203 544	215 470	141 375	185 208	202 227

As evident from the table regarding the service *sewerage* for commercial customer the reducing trend after 2011 remains the same.

1.2.3 Industrial customers

Depending on the level of pollution, the industrial customers are registered in the relevant category from the above-mentioned table.

1.3. ANALYSIS OF CONSUMPTION OF WSS SERVICES FOR THE PERIOD 2009 – 2015 –WASTEWATER TREATMENT.

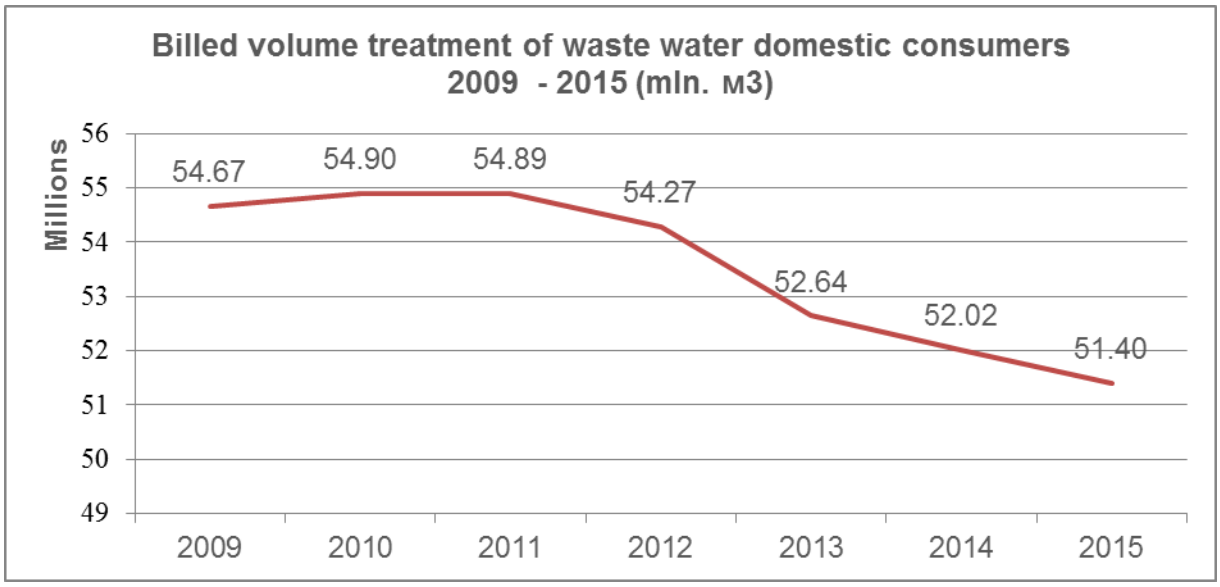
For the reporting period 2009-2015 the billed treatment of wastewater for the different type of customers is displayed in the table below:

Billed volumes waste water treated for WS Sofia	**2009** m^3	**2010** m^3	**2011** m^3	**2012** m^3	**2013** m^3	**2014** m^3	**2015** m^3
Households	54 665 594	54 895 051	54 890 444	54 274 442	52 641 689	52 020 382	51 403 808
Budget customers (and commercial equal to household)	4 964 509	4 734 689	4 718 526	4 615 843	4 143 581	3 961 846	3 927 628
Commercial customers, equal to household				4 815 137	8 123 154	7 694 874	8 241 916
Commercial – level of pollution 1 (up to 200 mg./l)	15 709 760	14 553 941	14 557 578	9 860 216	5 273 623	4 829 917	4 841 925
Commercial - level of pollution 2 (up to 200-600 mg./l)	763 970	950 665	1 025 163	806 101	714 824	798 495	737 737
Commercial - level of pollution 3 (over 600 mg./l)	411 323	260 229	183 034	212 364	137 407	178 766	195 755
Treatment TOTAL	76 515 156	75 394 575	75 374 745	74 584 103	71 034 277	69 484 279	69 348 767

Decreasing in the volumes of the treatment of the wastewater is registered after 2011 and the tendency of this type of service follows the decrease in the service for water supply for the same period.

1.3.1 Domestic customers

Following the trend of billed volumes for water supply and sewerage and for the service treatment related to domestic customers there is a decrease in the volumes on average by about -2% a year.



1.3.2 Budget and commercial customers

The data by years for the reporting period 2009 – 2015 are presented in the above table immediately after it. 1.3.

1.3.3 Industrial and other customers by levels of the pollution

For the customers from the *industrial* type with whom the company has signed agreements for providing the services of water supply, sewerage and wastewater treatment when using water for business activity, the billing of the volumes treated water depends on the level of pollution after water sample taken.
The following categories for the levels of pollution are determined:

- Level of pollution 1 - low
- Level of pollution 2 - middle
- Level of pollution 3 – high

The coefficients for allocation of the revenue to the level of pollution is determined in accordance with the instructions of EWRC and taking into account the specifics of the operational mode of WWTP Kubratovo and the individual indicators for pollution of customers in the relevant categories.

According to the completed analysis of the wastewater discharged from the customers (as per the valid at the moment classification) an average weighted value of the ratio COD / BOD is calculated for each category. The ratio between the values of the categories is used to determine the weight factor for the distribution of the recognized costs for discharged water with a higher load than that of domestic wastewater.

Detailed information about the billed volumes of treated wastewater by level of pollution is presented in the table in item 1.3

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1.4. ANALYSIS AND RATIONALE OF THE ESTIMATES FOR THE FUTURE CONSUMPTION OF WSS SERVICES FOR THE PERIOD 2017 – 2021 BY SERVICES.

Initial forecast of the future consumption of WSS services for the period 2017-2021 by services:

In accordance with the guidelines of EWRC when preparing the initial forecast of the future consumption of WSS services for the regulatory period 2017-2021, the company has reported the following factors

A. Forecast by the NSI for the change of the services population (by districts - I option under the hypothesis of convergence (realistic option) for the area

In its prognoses by districts - I option under the hypothesis of convergence that is defined as a realistic and complies with regulatory requirements of the EU for demographic and socio-economic development of the Member States, the NSI forecasts total increase for the period 2015-2020 with **40 608** inhabitants at the territory of the Municipality of Sofia (from 1 319 804 in 2015 to 1 360 412 in 2020), or an average annual increase of 8122 inhabitants. For 2021, the company has used in its forecast again the forecast of the NSI, but for the period 2020 – 2025 where the average annual increase is delayed by up to 6524 inhabitants:

Period	2015 (real)	2016	2017	2018	2019	2020	2021
Number of inhabitants	1 319 804	1 327 926	1 336 047	1 344 169	1 352 290	1 360 412	1 366 936
Annual variation (nos.)		+8 122	+8 122	+8 122	+8 122	+8 122	+6 524

B. Reduction of commercial losses of water, affecting positively on billed volumes

The reduction of commercial losses is one of the main priorities of the company, which will continue over the period of the current Business plan as well. Despite the fact that the trend in commercial losses to a great extent is inconsistent (as the effect of their reduction is single and does not accumulate i.e. established unmeasured water volumes subsequently transfer to a normal schedule for reporting and billing), the company forecasts preserving the trend in the next regulatory period, as shown in item 2.6. of the commercial part of the Business Plan:

Measured commercial	2015	2016	2017	2018	2019	2020	2021

losses							
m³ commercial losses forwarded for billing	902 112	800 000	800 000	800 000	800 000	800 000	800 000

- *The forecast for the commercial losses also includes the sancions for illegal connection за търговските загуби включва и санкциите от незаконно присъединяване*
-

C. Built new assets for disposal and treatment of waste water affecting positively the billed volumes of the relevant service

In connection with the construction of new assets for sewerage and treatment of wastewater and implemented projects in renovation of engineering infrastructure and projects that will be implemented or completed, the company has reported positive effects of the connection of new customers to the sewer network. By this way by execution of the projects in Bankya and in the neighborhoods Gradoman, Mihaylovo, Verdical and village Ivanyane, Benkovski neighborhood (Lazar Mihaylov str), Voynagovtsi neighborhood (Fenera str, Rositsa str and Stara planina str.) and Moderno predgradie neighborhood (Stefan Dunyov str.) from the beginning of 2017 totally 1 600 customers, in addition to the water supply they will be billed and invoiced and for services – sewerage and treatment of wastewater, as the expected positive effect is above 208 000 m3 average per year. During the next years of the current business plan is expected an implementation of other projects in the neighborhoods Gorublyane and Voinyagovtsi (9, 10 and11 stage) neighborhoods Moderno predgradie, Benkovski, Simeonovo, Malashevtsi. A detailed report of the expected additional volumes for sewerage and treated wastewater, as a result of the new implemented projects is presented in the table below:

Период	2017	2018	2019	2020	2021
Additionally billed volumes "sewerage and wastewater treatment" m³ for domestic and commercial customers	208 724	224 745	232 882	261 959	280 096

In case of forecasted future billed volume of newly-connected customers on the basis of the historical consumption of potable water for these customers the mean square method was used for the moving average of two period, where the variation coefficient is the lowest.

It is a widely used statistical method for forecasting the changes of the variations of the variable of the changing (moving) average costs. By the method are compared the errors (variations) having movable average values for past periods

The estimation of the future consumption by this method has the following steps (describing its application): 1. Use the actual data for billed volumes for a period of two years (2011 and 2012) and calculate the average value 2) From the actual data for 2012 we deduct the calculated average value over the period 2011-2012 and thus we calculate the so-called "error" 3). "Error" is squared to eliminate the cases in which we have a negative "error" 4). The steps from 1 to 3 are repeated and for the periods 2012-2013, 2013-2014 etc. until 2017 (the last year for which we have statistical data),

after which the squared values of the “errors” are summed 5) the same analysis from step 1 to step 4 is executed also for the period during which the average values for the three years (2011-2013) are used and a the period during which the average values of taken for 4 years (2011-2014) are used. The objective is to calculate for what period the average values give the least total sum of ‘error’ and respectively to use such period at the forecast of the billed values for 2018-2021. In the case of SV two years are concerned 6). That is why we take the average value of actual data for the billed volumes for the last two years (2016-2017), which in fact is an estimate for the billed volumes for 2018 7) Repetition of step 6

In connection with the requirement of the Regulator in the forecast for invoiced amounts to include new assets for sewerage and treatment, the company sent letters to MoS (our ref. № CB-1677/12.02.2016 and CB-1677/30.05.2016) to request information about the construction of specific assets which will be financed by European funds. In its reply dated 6.6.2016 (incoming letter No CB-1677), the MoS explained that it could not indicate specific projects as the preparation of regional pre-investment study for water supply and sewerage in the municipality are about to take place.

As we are unable at this stage to receive information from the MoS for specific projects which will be implemented in the new regulatory period, the forecast for the invoiced amounts "sewerage and treatment" for the period of this Business Plan do not take into consideration the impact of such projects.

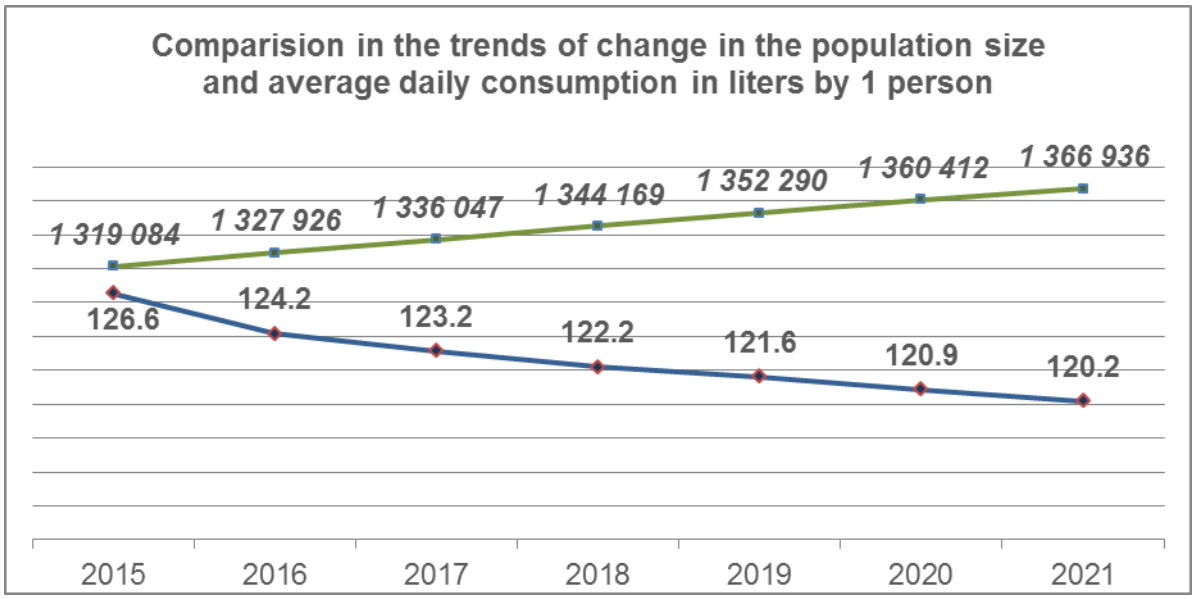
1.4.1. WATER SUPPLY

- **WS Sofia and WS Non-potable**

In preparing the initial forecasted billed water volume the company took into account the trends in the average billed volume of domestic customers. The same is shown in item 1.1.1 from the commercial part of the Business Plan), based on historical data showes an average reduction in consumption by about -2% annually as it is expected to be kept the same despite at a smaller pace.
The analysis, which was prepared, based on historical consumption and applying the method of average square deviation shows average reduction in average daily billed volumes of the population of around -0.7% for each year of the Business Plan 2017-2021.

Period	2015	2016	2017	2018	2019	2020	2021
Estimated average daily billed volumes of water per capita (in liters)	126,6	124,2	123,2	122,2	121,6	120,9	120,2

This decrease offsets the effect of the increase in population even the declining trend of daily average consumption is at a higher pace than the rate of population growth. Although the correlation between the two is negligible, this comparison is well illustrated in the graph below:



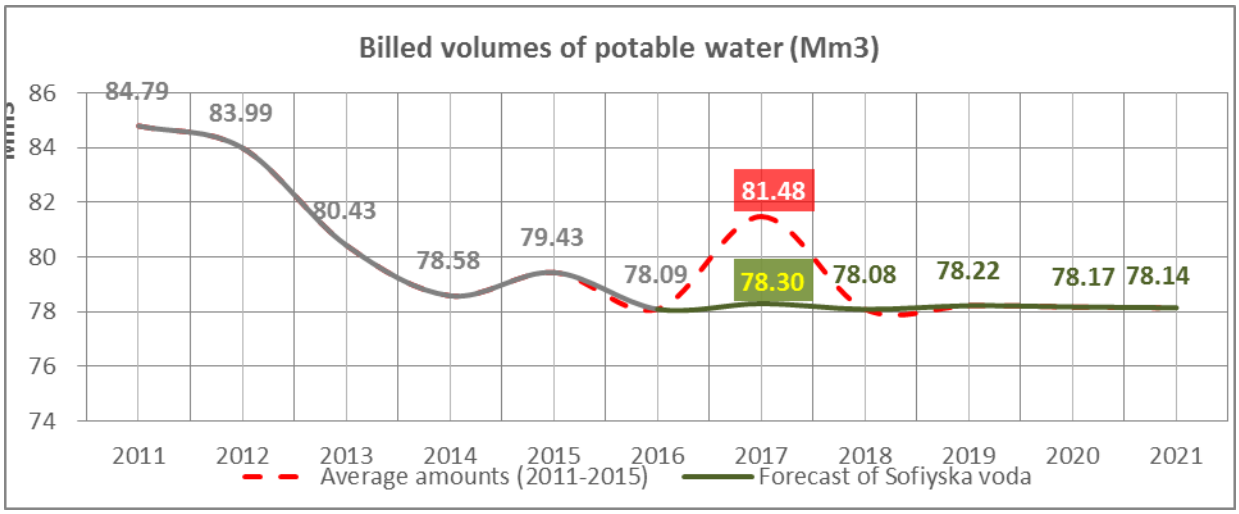
In the period of the business plan 2017 – 2021 the company expects the billed volumes from the service water supply not to have big changes and to remain stable around the amounts of the last two years. The peak in 2017 is due to average amounts of the last five years, as it also includes and the peak periods 2011/2012 and is not considered as realistic. Due to this reason the company prepared parallel forecast, in which the data for 2017 are not estimated by applying average data from the last 5 years period. After taking into account all objective factors affecting the consumption, including and the prognosis for the number of the population and the average daily billed volumes of one inhabitant for 2017 the company added its own prognosis for 2017 which consider as more realistic.

Based on the underlying calculations, taking into account all factors affecting the forecasts for future consumption of the water company reached the following data:

Period	2016 (BP 2016)	2017 (average 2011-15)	2017 (Prognosis of SV)	2018	2019	2020	2021
Unit	**m³**	**m³**	**m³**	**m³**	**m³**	**m³**	**m³**
Domestic customers	59 407 571	61 783 148	59 514 314	59 412 893	59 491 959	59 474 003	59 428 537
- **Effect from commercial losses on domestic customers**	780 000	660 382	660 382	660 382	660 382	660 382	660 382
Budget customers and equal to domestic	4 507 489	4 937 487	4 509 514	4 508 501	4 509 008	4 508 754	4 508 881
Commercial customers	13 372 937	14 076 622	13 590 847	13 481 892	13 536 370	13 509 131	13 522 750

- **Effect from commercial losses on commercial customers**	20 000	20 000	20 000	20 000	20 000	20 000	20 000
TOTAL billed potable water for WS Sofia	**78 087 997**	**81 477 641**	**78 295 057**	**78 083 669**	**78 217 718**	**78 172 270**	**78 140 550**

The graphical display of historical and forecasted quantity of billed potable water according the instructions of the Regulator for the period 2017 is presented in the graph below:



Future consumption of non-potable water from *industrial customers* was made based on the estimated amounts of the biggest consumer, which forms 96% of total use of non-potable water - "Toplofikatsia Sofia“ EAD. As a result, the quantities of non-potable water, which the company plans to implement in the next regulatory period, are as follows:

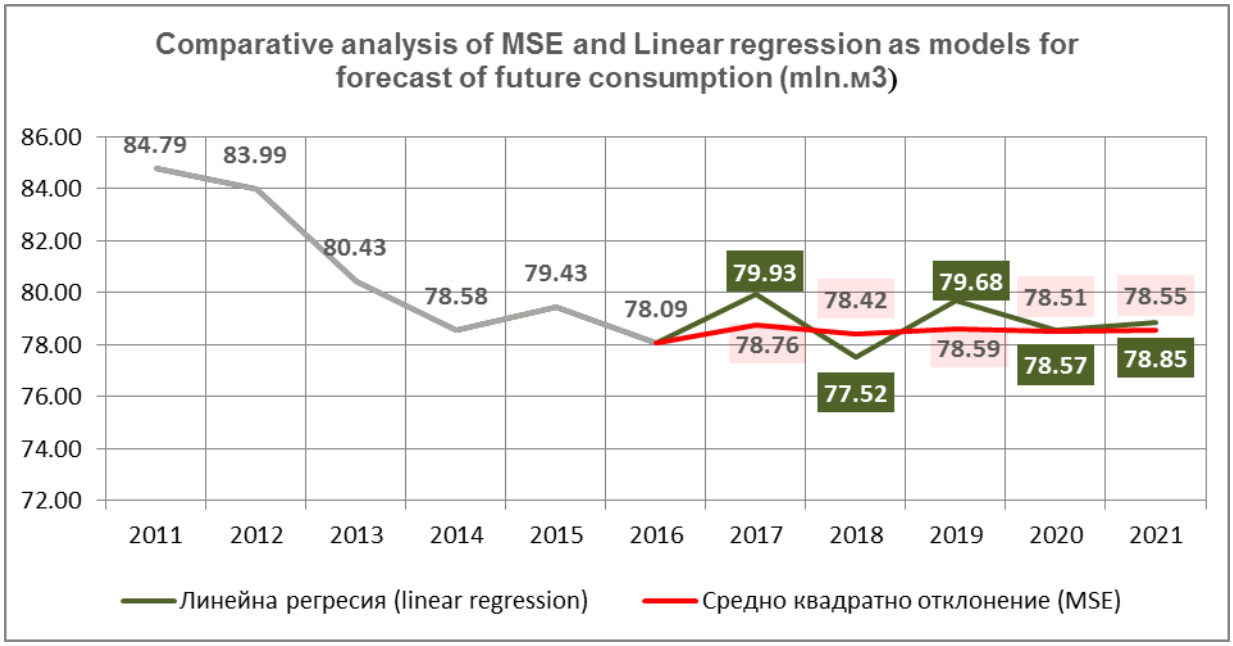
Period	2016 (BP 2016)	2017 (Average 2011-15)	2017 (Prognosis of SV)	2018	2019	2020	2021
Unit	**m³**	**m³**	**m³**	**m³**	**m³**	**m³**	**m³**
Industrial customers (non-potable water)	4 292 510	4 747 697	4 292 510	3 964 122	3 999 306	3 999 306	3 999 306

Total forecasted water consumption for the main water supply system - WS Sofia is presented in the table below:

Period	2016 (BP 2016)	2017 (Average 2011-15)	2017 (Prognosis of SV)	2018	2019	2020	2021
Unit	**M³**	**M³**	**M³**	**M³**	**M³**	**M³**	**M³**
Domestic customers	59 407 571	61 783 148	59 514 314	59 412 893	59 491 959	59 474 003	59 428 537
- **Effect from commercial losses on the domestic**	780 000	660 382	660 382	660 382	660 382	660 382	660 382

customers							
Budget customers and equal to domestic	4 507 489	4 937 487	4 509 514	4 508 501	4 509 008	4 508 754	4 508 881
Commercial customers	13 372 937	14 076 622	13 590 847	13 481 892	13 536 370	13 509 131	13 522 750
- **Effect from commercial losses on commercial customers**	20 000	20 000	20 000	20 000	20 000	20 000	20 000
Industrial customers (non-potable water)	4 292 510	4 747 697	4 292 510	3 964 122	3 999 306	3 999 306	3 999 306
TOTAL billed water volumes at WS Sofia	**82 380 507**	**86 225 338**	**82 587 567**	**82 047 790**	**82 217 024**	**82 171 576**	**82 139 856**

Additionally, when preparing the forecast for future consumption, the company prepared comparative models by applying statistical methods to predict future variables that also confirm the trend in consumption over the period of the next Business Plan 2017 – 2021. The Statistical methods were applied are average square deviation (mean square error) and linear regression (linear regression) as forecast results are presented in the graph below:



- **WS Beli Iskar and WS Bozhurishte**

The forecast on future billed water volumes of WS Beli Iskar and WS Bozhurishte is carried out according to the officially granted forecast data for the necessary water volumes of "Water Supply and Sewerage " Ltd. - Sofia, water volumes for village of

Gorni Okol and village of Dolni Okol are included in the estimated volumes for the Municipality of Samokov:

Period	2016 (BP 2016)	2017 (Average 2011-15)	2017 (Prognosis of SV)	2018	2019	2020	2021
Unit	**m3**	**m3**	**m3**	**m3**	**m3**	**m3**	**m3**
WS Beli Iskar	6 546 159	7 167 818	7 167 818	7 278 769	6 972 769	6 816 769	6 660 769
WS Bozhurishte	110 062	148 588	148 588	145 531	145 531	145 531	145 531
Total billed water volumes outside Sofia	**6 656 221**	**7 316 406**	**7 316 406**	**7 424 300**	**7 118 300**	**6 962 300**	**6 806 300**

1.4.2 Sewerage

In preparing the forecast for the drained volumes of wastewater, the company has applied output data for 2016 and 2017 according to the instructions of the regulator, where 2016 data presented are from the business plan 2016 and 2017 - an average value of data for the period 2011 – 2015. By this way regarding the forecasted amounts for drained wastewater for 2017 is observed a big peak in the results of the average data from the last 5-year period, which includes the years with most significant consumption 2011 /2012. Considering as more realistic, the company prepared a parallel prognosis as well using the method of Mean square error for moving average of two periods, where the variation coefficient is lowest.

Also in the estimated data are included future amounts due to the built new assets for sewerage and wastewater treatment (described above) which have a positive impact on the amounts invoiced for the relevant service.

As a result of the applied calculations and the estimate for future increase of the population by the NSI and the average daily consumption per capita for the relevant services, the following estimated data about sewerage were calculated.

Period	2016 (BP 2016)	2017 (Average 2011-15)	2017 (Prognosis SV)	2018	2019	2020	2021
Unit	**M^3**	**M^3**	**M^3**	**M^3**	**M^3**	**M^3**	**M^3**
Domestic customers	52 280 633	54 060 732	51 560 424	51 246 483	51 021 522	50 758 314	50 444 216
Effect from commercial losses on domestic customers	686 426	578 929	562 399	559 681	556 286	553 172	549 871
Budget customers and equal to domestic	4 172 888	4 574 577	4 167 220	4 170 054	4 168 637	4 169 345	4 168 991
Commercial customers	8 172 985	8 148 698	8 422 425	8 297 705	8 360 065	8 328 885	8 344 475
effects from commercial losses on commercial customers	17 601	73 282	17 476	17 394	17 291	17 197	17 097
Commercial – level of pollution 1 (up to 200 mg./l.)	5 080 594	6 790 582	5 079 344	5 079 969	5 079 657	5 079 813	5 079 735

Commercial - level of pollution 2 (up to 200-600 mg./l.)	745 015	816 424	741 378	743 197	742 287	742 742	742 515
Commercial - level of pollution 3 (over 600 mg./l.)	158 917	189 565	180 572	169 745	175 158	172 452	173 805
TOTAL billed discharged volumes for WS Sofia	**71 315 059**	**74 435 867**	**70 731 238**	**70 284 227**	**70 120 902**	**69 821 919**	**69 520 704**

1.4.3 Treatment of waste water

And in the preparation of the forecasted amounts of the service wastewater treatment, the company applied the same systematic approach as for the preparation of the above estimate for drained wastewater volumes. The summarized data as result of the applied calculations are presented in the below table:

Period	2016 (BP 2016)	2017 (Average 2011-15)	2017 (Prognosis SV)	2018	2019	2020	2021
Unit	**m^3**	**m^3**	**m^3**	**m^3**	**m^3**	**m^3**	**m^3**
Domestic customers	50 525 903	52 484 109	49 654 406	49 258 317	48 960 575	48 618 718	48 230 383
Effect from commercial losses on commercial customers	663 387	562 045	540 969	537 288	533 105	529 099	524 943
Budget customers and equal to domestic	3 959 392	4 273 485	3 943 510	3 951 451	3 947 480	3 949 465	3 948 473
Commercial customers	7 747 494	5 704 001	7 983 097	7 865 295	7 924 196	7 894 745	7 909 471
Effect from commercial losses on commercial customers	17 010	71 015	16 827	16 716	16 589	16 468	16 342
Commercial – level of pollution 1 (up to 200 mg./l.)	4 876 519	7 872 652	4 859 222	4 867 871	4 863 546	4 865 708	4 864 627
Commercial - level of pollution 2 (up to 200-600 mg./l.)	745 019	816 464	741 378	743 199	742 288	742 743	742 516
Commercial - level of pollution 3 (over 600 mg./l.)	150 544	181 465	173 149	161 847	167 498	164 672	166 085
TOTAL billed discharged volumes for WS Sofia	**68 685 268**	**71 965 235**	**67 912 557**	**67 401 982**	**67 155 276**	**66 781 620**	**66 402 839**

REVISED FORECAST FOR THE FUTURE CONSUMPTION OF WSS SERVICES FOR THE PERIOD 2017-2021 BY SERVICES

In compliance with the instructions received by the EWRC at the discussion that was held on 11.11.2016, for the purposes of business planning, the company revised its forecast for the billed water volumes for the period of the BP 2017-2021. There is detailed information below and justification of the applied approach at the forecasting and the methods for calculation by thje different types of services, water systems and types of customers:

1.1.1. Water supply

WS Sofia and WS Non-potable

- ***Domestic customers***

In compliance with the instructions of the EWRC the forecast for the base 2017 of the BP is made on the baisis of the average values for the period 2011-2015. For the rest of the period 2018-2021 the forecast of the billed water volumes includes:

- **Forecast of the average billed volumes per resident for the period 2018-2021 (l/day/resident)**

In order to determine the forecast potable water volumes of domestic customers, the Company uses the actual historical data from the previous years (2011 - 2016 till October including) to determine the average billed volume per resident per 24 hours. The analysis of the historical data for the mentioned period shows average annual decrease of -1.1 l/day/resident, as for the last 2 years the trend has changed its direction to a slight increase, which the Company does not consider to be durable because it results from the record warm summer in 2015.

That is why, it is still not possible to speak for durable reversing the trend of the average daily billed volumes per resident, but at the same time there is also a reduction in the rate. Due to this reason, after taking into account the average annual decrease by -1.15 l/day/resident over the last 6 years(2011-2016), on the grounds of actual histprical data the forecast is for decrease by more than 50%, i.e. – by -0.5 l/day/resident for each of the years of the period of the BP (2018 – 2021).

	Average daily volume in the first year of the period (w/out commercial losses)	Average daily volume in the lastyear of the period (w/out commercial losses)	Total reduction	Average annual reduction
Billed historic consumption (l/d/resident) 2011 – 2016	132,7 l	125,8 l	-6,9l	-1,2 l
Billed consumption (l/day/resident) over the period of the BP 2017 – 2021 .	126,4 l	123,9 l	-2,5 l	-0,5 l
TOTAL reduction of the rate of the average daily billed consumption			**-63,2%**	**-55,9%**

- **Forecast for the population growth rate – according to the forecast of the NSI (per districts - I option in case of convergence hypothesis (realistic option) for the respective district**

Average increase in the number of population for the period 2017-2021: **2.31%:**

Period	2017	2018	2019	2020	2021	Difference over the period 2017 - 2021
(1) Base	1 336 047	1 336 047	1 344 169	1 352 290	1 360 412	
(2) Annual increase (nos.)		+8 122	+8 122	+8 122	+6 524	**+30 890**
(3) Total number of residents for the relevant year (1+2)	1 336 047	1 344 169	1 352 290	1 360 412	1 366 936	**+2,31%**

- **Effect of the reduction of the commercial losses for domestic customers (water supply)**

Every year in the period 2018 – 2021, 780,000 m3 of commercial losses for the domestic customers will be added to the billed volumes

- Newly connected customers for the water supply service

On the basis of the historical data for previous years in terms of the implemented investment projects over the period 2013-2015 the number of the newly connected customers is negligibly small to impact the forecasted billed volumes

In 2013 – 6 domestic customers
In 2014 – 37 domestic customers and 1 commercial customer
In 2015 – 21 domestic customers

Despite it the company set an optimistic forecast of 30 newly connected customer per annum, with average for the period – 22 customers per annum. The forecast is increased in view of the big fluctuation and the total future billed volume is calculated on the basis of the average monthly billed volumes equal to 8 m^3/month

- ***Commercial customers***

And for the commercial customers the forecast for the base 2017 of the BP is made on the grounds of the average values for the period 2011-2015. For the rest of the period 2018-2021, the forecast of the billed volumes includes

Forecast for the billed volumes The Mean Squared Error method has been used on the basis of the historical data and 2016 was excluded in order to achieve higher precision of the calculations, as the method has been applied for the moving average of two periods where the variation coefficient is the lowest.

The forecast for the growth of the economic parameters has not been taken into account due to the lack of direct connection with the billed volumes. On the one hand, according to data from the NSI, the structural data for the GDP per regions and sectors show that in 2011 Sofia (the capital) contributes by 40% to the formation of the total GDP for the country, as 71% of them – in the service sector, which is characterized mainly with consumption for household needs and not for production needs from resource-intensive productions

In 2014 the picture is quite different - Sofia (the capital) forms 39% of the total GDP, and already 75% - in the service sector. Below is presented in the form of a graph the difference in the gross value added (GVA), which measures the economy using he method of supply unlike the GVA, which is measured by the demand method. It is considered that the GVA is even a more precise indicator of the economic situation, as it is equal to the GDP, but without corrections such as net taxes and subsidies

While from the total GDP, formed in the industrial sector, 24% was formed in Sofia (5.07 billion BGN) in 2011, in 2014 – it decreased to 20% (3.95 billion BGN), i.e. a drop of -22% for four years. It is due to: (1) still shrunk crediting; (2) the new investments in the business in Sofia are mainly in fast growing sectors such as outsourcing services (call centers) and IT i.e. in the service sector; (3) the realized investments in resource-intensive productions for repair of leaks and rehabilitation of internal networks, as well as new technologies for reduction of the consumption of potable water for production needs (Nestle Bulgaria AD, Sopharma AD etc.) and/or alternative own water sources. The last is well expressed also in the published annual financial statements (AFS) of some of the companies which are big consumers of water (mainly public companies, where the AFS together with the additional notes to them are accessible) – e.g. in the element „water consumption" of two of the big public companies and big customers– Sopharma AD (pharmaceutical company) , Aroma AD:(cosmetics company) and Tandem – B (food company)

in k BGN	2011	2012	2013	2014	2015	Change over the period2011-15
Sopharma AD	909	947	889	752	494	-45,7%
Aroma AD	143	84	104	98	113	-21,0%
Tandem-B OOD	145	116	85	113	112	-22,8%
TOTAL	**1197**	**1147**	**1078**	**963**	**719**	**-39,9%**

The three companies have made investments leading to reduction of these costs – e.g. Sopharma and Aroma made overall reconstruction of the internal networks whereas Tandem B repaired leaks along their network. Another big customer – Nestle Bulgaria AD shut down some production cycle and terminated the use of water for cooling of their machines.

- In addition to the stated so far, the factual situation resulting from the current political crisis, following the resignation of the government should not be ignored. It could have negative impact on the short-term and the middle-term estimates for economic development**The impact from reduction of commercial losses for commercial customers (water supply)**

Each year over the period 2018 – 2021 to the billed volumes will be added 20,000 m^3/year of commercial losses for commercial customers

- **Newly connected customers to water supply**

5 newly- connected customers per year are set. Their future total billed volume is calculated in accordance with the average monthly actual builled volumes for these type of customers equal to 270 m^3 / month

- ***Budget customers***

- **Forecast of the billed volumes**

As for commercial customers the method of the mean squared error is used again based on the historical data and 2016 is excluded for better accuracy of the calculations. The method is applied for the moving average of the two periods where the variation coefficient is the lowest.

- ***Industrial customers (non-potable water)***

- **Forecast of the billed volumes**

The forecast for the future consumption of non-potable water by industrial customers is not differenrt from the initial forecast of the company and is made on the baisis of the necessary forecasted volumes of the biggest customer, which forms 96% of the total consumption of non-potable water – *Toplofikatisa – Sofia EAD*. SV made an official request to the district heating company regarding their needs for future volumes non-potable water, and their response is provided as an additional appendix to this Business Plan

On the grounds of the applied methods and stated reasons at the calculation of the forecasted billed volumes for the ***water supply service*** (potable and non-potable water) for the WS *Sofia* and *Non-Potbale* the following forecasted billed volumes were deducted:

Period	2016	2017	2018	2019	2020	2021
Unit of measure	**m³**	**m³**	**m³³**		**m³³**	
Domestic customers	59 407 571	61 663 531	61 152 216	61 278 639	61 402 098	61 522 592
• impact from commercial losses of domestic customers	780 000	780 000	780 000	780 000	780 000	780 000
Impact from the increase of the population			371 734	370 252	368 769	295 047
Impact from newly-connected customers			2 880	2 880	2 880	2 880
Budget customers and equal to domestic customers	4 507 489	4 937 487	4 724 513	4 831 000	4 777 756	4 804 378
Commercial customers	13 372 937	14 076 622	13 942 690	14 009 656	13 976 173	13 992 915
Impact from the commercial lossesof commercial customers	20 000	20 000	20 000	20 000	20 000	20 000
Impact from newly-connected customers	0	0	16 200	16 200	16 200	16 200
TOTAL billed potable water of commercial customers ”	**78 087 997**	**81 477 641**	**81 010 233**	**81 308 627**	**81 343 877**	**81 434 012**
WS Non-potable - Industrial customers	4 292 510	4 747 697	3 964 122	3 999 306	3 999 306	3 999 306
TOTAL billed volumes for water supply	**82 380 507**	**86 225 338**	**84 974 354**	**85 307 933**	**85 343 183**	**85 433 318**

WS Beli Iskar and WS Bozhurishte

The forecast of the billed volumes for the stated water system is not different from the initial forecast of the company and is made in accordance with the officially provided forecast data for the necessary water volumes from Vodosnabdiyavane I kanalizatsia EOOD – Sofia (ViK EOOD-Sofia). In the forecatsed volumes for Samokov Municipality are included also the water volumes for Gorni Okol and Dolni Okol villages. SV made an official request to ViK EOOD regarding their expected volumes for the period of the BP 2017-2021 and their response is available as an appendix to this Business Plan.

Period	2016	2017	2018	2019	2020	2021
Unit of measure	м³	m³	m³	m³	m³	m³
WS Beli Iskar	6 546 159	7 167 818	7 278 769	6 972 769	6 816 769	6 660 769
" WS Bozhurishte	110 062	148 588	145 531	145 531	145 531	145 531
Total billed water volumes outside Sofia	**6 656 221**	**7 316 406**	**7 424 300**	**7 118 300**	**6 962 300**	**6 806 300**

1.2.1. Sewerage

- **WS Sofia and WS Non-potable**

- ***Domestic customers***

n compliance with the instructions received from EWRC at the discussion held on 11.11.2016 the forecast for the base 2017 of the Business Plane is implemented on the basis of the average values for the period 2011-2015. For the rest of the period 2018-2021 the forecast of the billed water volumes includes:

- **Forecast for the average billed volumes per number of resident over the period 2018-2021 (l/day/resident) for sewerage**

As for water supply the company forecasts considerable decrease in the rate of reduction and having average daily billed consumption of drained wastewater on the basis of which the forecast for the future consumption of domestic customers for sewerage is made, there is also reduction in the average daily billed consumption by -1.1 l/day/resident over the last 6 years(2011-2016), on the grounds of actual historical data by and 0.5 l/day/resident for each of the years of the period of the BP (2018 – 2021).

	Average daily volume in the first year of the period (w/out commercial losses)	Average daily volume in the lastyear of the period (w/out commercial losses)	Total reduction	Average annual reduction
Billed historic consumption (l/d/resident) 2011 – 2016	116,7l	110,0 l	-6,7l	-1,1l
Billed consumption (l/day/resident) over the period of the BP 2017 – 2021	110,9 l	108,5l	-2,3 l	-0,5 l
TOTAL reduction of the rate of the average daily billed consumption			**-65,4%**	**-58,4%**

- **Forecast for the population growth rate according to the forecast of the NSI (per districts - I option in case of convergence hypothesis (realistic option) for the respective district**

The same forecast is applied as for water supply service

- **Effect of the reduction of the commercial losses for the domestic customers (sewerage)**

As for water supply for each year from the period 2018 - 2021 to the invoiced volumes reciprocal quanitity is added from the quantity distributed to the domestic customerrs regarding water supply.

- **Newly connected customers to the sewerage service**

As at the initial forecast of the company complies with the instruction of the regulator regarding constructed new assets or assets which are about to be constructed during the new regulatory period for sewerage and wastewater treatment having positive impact on the billed volumes for the relevant service. The investment projects cover the construction of new assets in the town of Bankya and the residential quarters Gradoman, Mihaylovo, Verdikal and the village of Ivanyane, Benkovski r.q. (Lazar Mihaylov St), Voynyagovtsi r.q. (Fenera St, Rositsa St. and Stara Planina St) and Moderno Predgradie (Stefan Dunyov St.). The forecasted billed volumes for sewerage of the customers, who will be connected are made on the basis of their historical billed consumption for water supply and interpolation of these data using the Mean Squared Error method for the moving average again over two periods where the variation coefficient is the lowest to deteremine their future billed volumes.

The summarized report on the expected additional volumes of drained and treated wastewater as result of newly-implemented projects is presented in the table below:

Period	2018	2019	2020	2021
Additionally billed volumes "sewerage and wastewater treatment" m³ for domestic customers	211 400	218 335	248 651	263 205

- ***Commercial customers***

Like for the commercial customers for sewerage service, the forecast for the base 2017 of the business plan is made on the grounds of the average values for the period 2011-2015. For the rest of the period 2018-2021 the forecast of the billed water volumes includes:

- **Forecast for the billed volumes**

The justification for the economic growth is the same as for water supply of commercial customers. That is why; the forecasted future billed consumption

was made again using the Mean Squared Error method on the basis of the historical data and 2016 was excluded in order to achieve higher precision of the calculations, and the method has been applied for the moving average of two periods where the variation coefficient is the lowest.

- **Impact from reduction of commercial losses for commercial customers (sewerage)**

As for water supply for each year from the period 2018 - 2021 to the invoiced volumes reciprocal quanitity is added from the quantity distributed to the commercial customerrs regarding water supply

- **Newly connected customers to the sewerage service**

The implemented investment projects which cover the regions stated abve regarding domestic customers, include aslo the connection to the newly constructed sewerage of commercial customers. The expected forecasted billed volumes from them are as follows:

Period	2018	2019	2020	2021
Additionally billed volumes "sewerage and wastewater treatment" m³ for commercial customers (without domestic)	13 345	14 547	13 308	13 891

- **Forecast of the billed volumes for the levels of pollution for sewerage**

Depending on the level of pollution, the volumes of wastewater for the commericla customers are grouped in the following three categories: first, second and third level

For the preparation of the forecast the Mean Squared Error method has been used on the basis of the historical data over the period 2011-2016 and 2016 was excluded in order to achieve higher precision of the calculations, and the method has been applied for the moving average of two periods as the model shows the lowest variation for this range

- ***Budget customers***

- **Forecast of the billed volumes**

As for commercial customers the method of the mean squared error is used again based on the historical data and 2016 is excluded for better accuracy of the calculations. The method is applied for the moving average of the two periods where the variation coefficient is the lowest.

On the grounds of the applied methods and stated reasons at the calculation of the forecasted billed volumes for the ***sewerage service*** the following forecasted billed volumes were deducted:

Period	2016	2017	2018	2019	2020	2021
Unit of measure	**m³**	**m³**	**m³**	**m³**	**m³**	**m³**

Domestic customers	52 280 633	54 060 732	53 665 675	53 746 588	53 824 538	53 899 522
impact from commercial losses of domestic customers	686 426	578 929	575 976	575 352	574 729	574 229
Impact from the increase of the population			326 224	324 742	323 260	258 489
Impact from newly-connected customers			211 400	218 335	248 651	266 205
Budget customers and equal to domestic customers	4 172 888	4 574 577	4 368 065	4 471 321	4 419 693	4 445 507
Commercial customers	8 172 985	5 993 659	7 832 761	7 413 210	7 622 986	7 518 098
Impact from the commercial lossesof commercial customers	17 601	73 282	17 600	17 600	17 600	17 600
Impact from newly-connected customers			13 345	14 547	13 308	13 891
level of pollution 1 (up to 200 mg/l)	5 080 594	8 148 698	6 113 396	6 631 047	6 372 222	6 501 634
level of pollution 2 (up to 200-600 mg/l)	745 015	816 424	777 082	796 753	786 918	791 836
level of pollution 3 (exceeding 600 mg/l)	158 917	189 565	195 896	192 730	194 313	193 522
TOTAL billed volumes of drained wastewater	**71 315 059**	**74 435 867**	**74 097 420**	**74 402 227**	**74 398 217**	**74 480 532**

1.4.3. Wastewater treatment

- **WS Sofia and WS Non-potable**

- ***Domestic customers***

In compliance with the instructions received from EWRC at the discussion held on 11.11.2016 the forecast for the base 2017 of the Business Plane is implemented on the basis of the average values for the period 2015-2016. For the rest of the period 2018-2021 the forecast of the billed water volumes includes

- **Forecast of the average billed volumes per resident for the period 2018-2021 (l/day/resident) for wastewater treatment**

As for water supply and sewerage services the company forecasts considerable decrease in the rate of reduction and having average daily billed consumption of wastewater treatment on the basis of which the forecast for the total consumption of domestic customers for this service is made, here also the average daily billed consumption drops by -1.1 l/day/resident over the last 6 years(2011-2016), on the grounds of actual historical data and by -0.5 l/day/resident for each of the years of the period of the BP (2018 – 2021).

	Average daily volume in the first year of the period (w/out commercial losses)	Average daily volume in the lastyear of the period (w/out commercial losses)	Total reduction	Average annual reduction
Billed historic consumption	113,6 l	106,4 l	-7,2l	-1,2 l

(l/d/resident) 2011 – 2016				
Billed consumption (l/day/resident) over the period of the BP 2017 – 2021	107,6 l	105,3 l	-2,3 l	-0,5 l
TOTAL reduction of the rate of the average daily billed consumption			-67,8%	-61,4%

- **Forecast for the population growth rate – according to the forecast of the NSI (per districts - I option in case of convergence hypothesis (realistic option) for the respective district**

The forecast that is enclosed is the same as for potable water supply and seweragae services

- **Effect of the reduction of the commercial losses for domestic customers (wastewater treatment)**

. For each year from the period 2018 - 2021 to the invoiced volumes reciprocal quanitity is added from the quantity distributed to the domestic customers at water supply

- **Newly connected customers to the wastewater treatment service**

As at the initial forecast, the company complies with the instruction of the regulator regarding constructed new assets or assets which are about to be constructed during the new regulatory period for sewerage and wastewater treatment having positive impact on the billed volumes for the relevant service. The investment projects cover the construction of new assets in the town of Bankya and the residential quarters Gradoman, Mihaylovo, Verdikal and the village of Ivanyane, Benkovski r.q. (Lazar Mihaylov St), Voynyagovtsi r.q. (Fenera St, Rositsa St. and Stara Planina St) and Moderno Predgradie (Stefan Dunyov St.). The forecasted billed volumes for sewerage of the customers, who will be connected are made on the basis of their historical billed consumption for water supply and interpolation of these data using the Mean Squared Error method for the moving average again over two periods where the variation coefficient is the lowest to deteremine their future billed volumes.

The summarized report on the expected additional volumes of drained and treated wastewater as result of newly-implemented projects is presented in the table below

Period	2018	2019	2020	2021
Additionally billed volumes “sewerage and wastewater treatment” m³ for domestic customers (without commercial)	211 400	218 335	248 651	263 205

- ***Commercial customers***

For the commercial customers as well for the wastewater treatment service, the forecast for the base 2017 of the BP is made on the basis of the average values for the period 2011-2015. For the rest of the period 2018-2021 the forecast of the billed water volumes includes:

- **Forecast for the billed volumes**

The justification for the economic growth is the same as for water supply and sewerage of commercial customers. That is why; the forecasted future billed consumption is made again using the Mean Squared Error method on the basis of the historical data and 2016 was excluded in order to achieve higher precision of the calculations, and the method has been applied for the moving average of two periods where the variation coefficient is the lowest.

- **Effect of the reduction of the commercial losses for the domestic customers (wastewater treatment)**

. As for water supply and sewerage for each year from the period 2018 - 2021 to the invoiced volumes reciprocal quanitity is added from the quantity distributed to the domestic customerrs regarding water supply

- **Newly connected customers to the sewerage service**

The implemented investment projects which cover the regions stated above regarding domestic customers, include aslo the connection to the newly constructed sewerage of commercial customers. The expected forecasted billed volumes from them are as follows:

Period	2018	2019	2020	2021
Additionally billed volumes "sewerage and wastewater treatment" m³ for commercial customers (without domestic)	13 345	14 547	13 308	13 891

- **Forecast of the billed volumes for the levels of pollution for wastewater treatment service**

. Depending on the level of pollution, the volumes of treated wastewater for the commericla customers are grouped in the following three categories: first, second and third level..Regarding the industrial customers with which the company has a signed contract for water supply, sewerage and wastewater treatment services, the billing of the volumes of treated water depends on the level of pollution registered after sampletaking and laboratory test of the samples from the wasterwater of these customers.

For the preparation of the forecast the mean squared error method has been used on the basis of the historical data over the period 2011-2016 and 2016 was excluded in order to achieve higher precision of the calculations. The method has

been applied for the moving average of two periods as the model shows the lowest variation for this range

- ***Budget customers***

- **Forecast of the billed volumes**

Commercial customers the method of the mean squared error is used again based on the historical data As for and 2016 is excluded for better accuracy of the calculations. The method is applied for the moving average of the two periods where the variation coefficient is the lowest.

On the grounds of the applied methods and stated reasons, which have been mentioned so far, at the calculation of the forecasted billed volumes for the ***wastewater treatment service*** the following forecasted billed volumes were deducted:

Period	2016	2017	2018	2019	2020	2021
Unit of measure	**m³**	**m³**	**m³**	**m³**	**m³**	**m³**
Domestic customers	50 525 903	52 484 109	52 081 792	52 153 077	52 221 398	52 286 755
• impact from commercial losses of domestic customers	663 387	562 045	569 081	568 553	568 025	567 602
Impact from the growth of the population			316 596	315 114	313 632	250 754
Impact from newly-connected customers			211 400	218 335	248 651	266 205
Budget customers and equal to domestic customers	3 959 392	4 273 485	4 100 556	4 187 020	4 143 788	4 165 404
Commercial customers	7 747 494	5 704 001	6 961 351	6 332 676	6 647 014	6 489 845
Impact from the commercial lossesof commercial customers	17 010	71 015	17 000	17 000	17 000	17 000
Impact from newly-connected customers			13 345	14 547	13 307	13 891
level of pollution 1 (up to 200 mg/l)	4 876 519	7 872 652	6 357 288	7 114 970	6 736 129	6 925 549
level of pollution 2 (up to 200-600 mg/l)	745 019	816 464	777 100	796 782	786 941	791 862
level of pollution 3 (exceeding 600 mg/l)	150 544	181 465	188 610	185 037	186 824	185 931
TOTAL billed volumes for wastewater treatment	**68 685 268**	**71 965 234**	**71 594 119**	**71 903 113**	**71 882 710**	**71 960 799**

In conclusion the forecasted billed water volumes for the three services in WS Sofia are presented in a graph

2. ANALYSIS AND PROGRAM FOR REDUCTION OF WATER LOSSES AND INCREASING OF DEBT COLLECTION

2.1. ANALYSIS OF ERRORS IN THE ACCURACY OF WATER METERS (WATER METERS DO NOT ACCURATELY READ THE FLOWING WATER VOLUMES)

As of 2010 a database was set up for revenue meters of the company which is updated and corrected on a monthly basis. The database contains information for water meters, customers and consumption.

On the basis of the used water meters throughout the years, in particular average read consumption by diameters in compliance with the technical characteristics and the period for using the water meters, an analysis was carried out of the potential commercial losses which may be due to unread by meters water.

The results show possible potential losses between 2% and 10% on annual basis from total read consumption according to the measurement devices.

The activities and measures, which may be initiated towards reduction of the unread water volumes flowing through a measurement device, are comparatively limited given the obligatory complying with:

- Dimensioning of the measurement devices in the projects for designing building's water main installation under art. 32 (1) under Ordinance No. 4 dated June 17, 2005 for designing, construction and operation of building's water main and sewerage installations;
- Determining the fire-safety needs in designing of buildings, facilities and installation of buildings under Ordinance 2 for fire-safety and technical norms.

Given that:

- Not all points for water supply have been encompassed by a device for commercial measurement (reasons are described in item 5.1.1.);
- Not all installed and maintained by the company devices for commercial measurement are in a period of metrological validity (the reasons are described in item 5.1.1.);

Up to this moment the main challenge and priority for Sofiyska Voda JSC was to maximize the process for encompassing of points of water supply with measurement devices and their setting into metrological validity which is a reason for the main resources and efforts to be pushed towards this direction.

2.2. ANALYSIS OF THE ERRORS IN THE PROCESS OF WATER METER *READING (METER READERS MANAGEMENT)*

The main errors in performance of the meter reading activity which might generate commercial losses are the following:

- not submitted water meters in a periodical schedule for reading;
- absence of reading of the measurement device;
- incorrectly entered reading by a meter reader;
- manipulated reading by a meter reader;

Activities and measures for prevention and minimization of the errors:

- not submitted meters during periodical schedule for reading;

The organization of the meter reading activity for the customers is as follows:

- the key and commercial customers and big consumers of the Company are read on a monthly basis;
- the domestic customers in condominiums are read 4 times a year;
- the domestic customers with water meters on water service connections for properties with water meter node requiring preparation for the winter are read 3 times a year.

The operative system performs regular checks on the activity in regard to the following indicators:

- including newly installed meters in the annual schedule for performance of the activity;
- submitted water meters for reading to meter readers according to annual schedule for performance of the activity (whether all water meters, which are in a period for reading, have been encompassed)
- The submitted work by the meter readers after closing of the reporting period) presence of information for all submitted meters).

- absence of reading of a measurement device;

In view of minimizing the cases of water meters without reading, there are available different ways for informing customers about upcoming reading:

- notices left on a visible place on field indicating day and hour for visit from a meter reader;
- service centers;
- telephone center;
- internet site of the company;
- Information is present in the invoices for a following period for reading of the water meter according to schedule.

In view of optimization of the activity and success rate for the meter reading, a base was created for the unread water meters for a period longer than 1 year, which is updated on a monthly basis. Measures are undertaken for every group of customers for taking the readings or clarifying the reason for lack of readings:

- sending letters to customers, informing them about the next scheduled period of reading;
- direct contact with customers and specifying the date for ensuring access to the water meter;
- flexible time for a visit – out of the normal office hours, weekends;
- visits made by other Company departments;
- collection of data from other sources – neighbors, local municipalities, etc.;
- optimization of the way of informing the customers about the coming actual reading:

- incorrectly entered reading/manipulated reading by a meter reader;

The following checks are performed on the entered by a meter reader data:

- available internal team performing checks on the activity of the meter readers related to:
  - a check on a regular schedule for reading;
  - a check on left notices for a follow-up reading;
  - a check on performed visits and already read meters;
  - a check on entered information;

- submitted objections/reclamations by customers against entered readings by meter readers.

As of the start of 2016 mobile electronic devices have been brought into use for entering data for water meters during a visit of customers according to a preliminary arranged schedule;

The entire activity is expected to be automated by eliminating the paper copies and the manual data entry for water meters, customers and properties.

The expected advantages are:

- Elimination of data entry on paper carnet pages;
- Elimination of manual task allocation by meter readers;
- Elimination of manual data entry for properties, customers and water meters in the system;
- checks on difference in consumption for entering information – preventing a possible entering of a wrong reading;
- Reduction of the period between reading and billing – at the moment it is two months
- Possible GPRS communication;
- GPRS tracking;
- Reduction of the human error factor

2.3. ANALYSIS OF ERRORS IN DATA TRANSFER FROM THE WATER METERS TO THE BILLING SYSTEM

After implementation of the new operative system the entire activity including – generation of schedule, work allocation, registration of information on field, validation of results and control on the activity is focused and merged into one unit – Technical Customer Support department.

Software application is available for automated entering of the registered data in the billing system.

- when entering the schedule for reading–control on not submitted water meters for reading
- when entering information- control on differences in consumption;
- When entering of information in the billing system – certain criteria are set according to the type of customer and average consumption rate (deviations in volume in %) which are visualized, checked individually and if necessary are submitted for additional inspection on field in order to avoid issuance of invoice with incorrect data.

2.4. ANALYSIS OF UNAUTHORIZED CONSUMPTION – THEFTS AND ILLEGAL CONSUMPTION

Survey of illegal/ non-regulated water consumption:

The objective is to find and penalize illegal/non-regulated connections, to take subsequent actions to terminate the illegal / non-regulated water consumption.

Non-regulated connections to the water supply and sewerage network are determined through the following:

- Reactive checks – planned inspections upon signals (internal or external) about non-regulated connections to the water supply and/ or sewerage system
- Proactive checks – extraordinary, escalated cases;
- Systematic checks – inspection of sites in specific areas.

Additional projects:

- inspection of addresses for which there is a signed Preliminary contract with SV, but there is no data about a signed Connection Contract;
- inspection of addresses for which negative initial data have been issued;
- inspection of carwashes;
- inspection of addresses with terminated water supply;
- inspection of properties in a certain residential quarter or villa area;
- Inspection of addresses, which have access to the sewerage network, but are not registered customers.

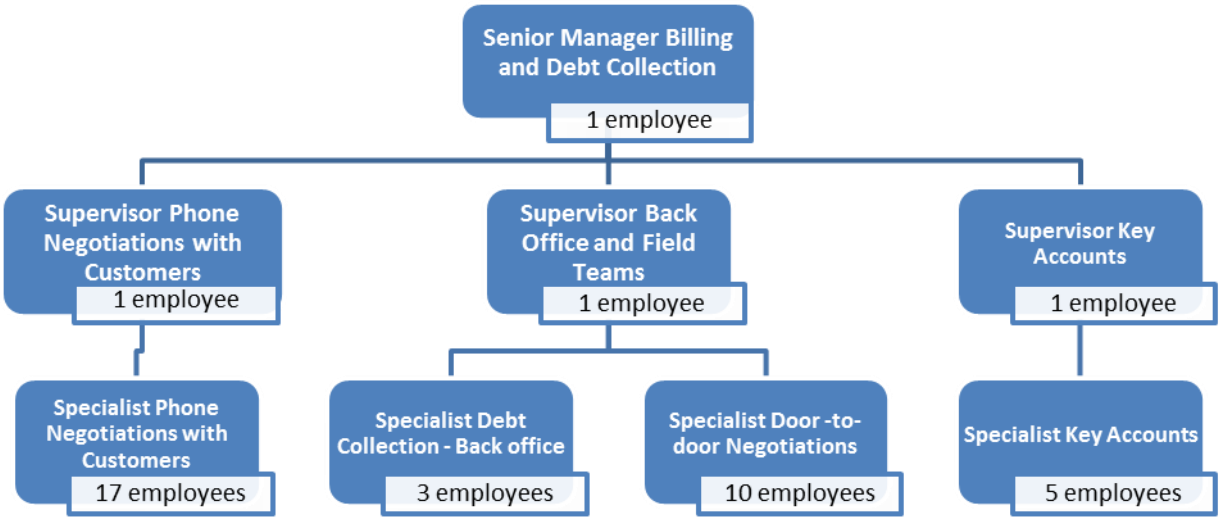
Expected results:

- terminating non-regulated water consumption
- imposing penalties;
- legalizing customer;
- metering and billing subsequent water consumption of legalized sites;
- entering the data on water service connections, customers, water meters in geographic information system

2.5. ANALYSIS OF DEBT COLLECTION PROCESS MANAGEMENT

The organizational structure of Sofiyska Voda JSC has a separate internal department "Debt collection," which is part of the Commerce Department of the company. The main objective of the department is to improve the liquidity of the company by collecting overdue receivables from its customers and reduce the total amount through various combined approaches and methods in negotiations with debtors according to their type, risk profile, spatial location, payment history and behavior as a way of connection to the water supply network.

As part of the structure of the department "Debt Collection" operates also and team "Key accounts", mainly focusing on comprehensive service and maintaining close relationships with key customers of the company - strategic sites, government and budgetary institutions and sites which are big water consumers. As of 05.31.2016, the total employee number in "Debt Collection" is 39, as their functions are distributed according to the presented structure of the department:



Debt collection management covers practices and activities, divided in several main areas:

1. "Soft" collection - includes activities of indirect contact with debtors who are reviewed as the first stage in the process of collection and communication is graded depending on the complexity of the cases:
   a. *Reminding letters* - used as a reminder for overdue payments, using mainly two types of letters - for information on the debt and the delay, and an invitation for *out-of-court settlement of the debt*, (has the nature also of a notification for impending court actions in case of non-payment). Annually on average are performed 6 campaigns for sending of 50-60 thousand reminding letters.
   b. *Electronic contact* - in the period of this business plan is scheduled to send short electronic messages (SMS) to remind company's customers on late payment and the amount due.
   c. *Contacts and talks by phone* - phone contacts with debtors are the most powerful and effective tool for debt collection of the company. Through it not only is provided an opportunity to request payments and negotiating flexible rescheduling, but also an opportunity to obtain information on the reasons for lack of payment and habits of the debtor that will be helpful in choosing the next approach for collection of the debts in the event of nonpayment. On average each month there are about 25 thousand telephone contacts.
   d. *Deferred payment agreements* - this customer-oriented approach applies to customers with temporary financial difficulties, as the company offers flexible rescheduling taking into account the desires and possibilities of the customers facing financial problems. On average each month the company signs deferred payment agreements with between 250 and 300 customers.

2. ***Visits and negotiations at address*** - when performing the above actions does not lead to result, direct contact with the debtor at the address of consumption is sought. The company has five mobile teams consisting of two employees each equipped with company car, mobile cash registers and POS terminals. They are

authorized to accept cash and non-cash payments and conclude deferred payment agreements on the address. In total the mobile teams visit around 4,000 addresses each month.

3. Legal actions - the Company initiates legal action against debtors of the company when all other methods for debt collection were applied and did not lead to results. The types of legal proceedings brought by the company are *order for payment* as per art. 410 of the Civil Procedure Code and *applications*. The started legal actions and various stages of court proceedings are registered in the new system in the respective customer accounts which contributes to enhancing control and traceability at different stages of debt collection. The number of court proceedings, which the company initiates on average a month are 400.

4. Debt collection agencies - Sofiyska Voda JSC assigns customer cases to external debt collection agencies, according to the signed trade agreement with them. The procedure for selection of contractor(s) is applied in accordance with the Public Procurement Act.

5. Disconnection of services – is used as a last measure to debtors with large debt to the company, mainly companies that deliberately and purposefully avoid the payment of their debts.

Choosing the right approach and implementation of appropriate strategies are essential for the effective implementation of the activities on securing of receivables. The cycle for debt collection starts even before the formation of overdue debt as the time between the different phases of contacts for collection depend on the risk profile and debtor type. Basically, the phases of debt collection are as follows:

- **First delay (low risk)** – customers which are in this group are generally long-term clients of the company, who have not had overdue sums to this date and have delayed the payment usually due to some specific problem, change of the bank account for which the operator is not informed (on direct debit) or short-term financial problems. The strategy includes: telephone call and / or sending a letter.
- **Short-term delays (low risk)** - customer accounts in this category are usually with 3-4 unpaid invoices, which are not yet considered problematic. The strategy includes: sending a letter and / or phone call.
- **Significant delays (medium risk)** - debtors who reach this phase have not paid between four months up to one year. The strategy includes: phone contact, invitation for voluntary payment, visits at the address, assignment to a collection agency.
- **Financial difficulties (low to medium risk)** - can be reviewed as a subcategory of any of the already listed as the main approach here is to negotiate an agreement for rescheduling of the debt with the customer, who complies both with the internal rules of the company, and individual abilities of the customer to pay.
- **Receivables which are difficult to collect (high risk)** - this phase of debt collection includes customer accounts with debt whose maturity is more than one year. The strategy includes: an invitation for voluntary payment,

visits at the address, legal action or assignment to a collection agency and disconnection of services where applicable.

2.6. LINK BETWEEN THE COMMERCIAL LOSSES REDUCTION AND THE BILLED VOLUMES

It should be noted that not all identified and covered commercial losses are transformed in billed water volumes due to certain specificities:

- Measured but unbilled commercial losses – cases mainly in the internal site networks or individual cases, which for political, social reasons and regulatory or court procedures cannot be solved in favor of the Company;

Stopped commercial losses – these are cases in which after completion of activities on behalf of the Company, unregulated/unbilled consumption is stopped as follows:

- Disconnected water service connections;
- Removal of by-pass connections, before the water meter node;
- Completed repairs on the internal network;
- Installation of water meters in properties, for which till the installation no volumes are billed in accordance with a measuring device;
- Replacement of obsolete revenue meters.

In the last cases the customers themselves limit the consumption in view of its actual measurement.

As a result the actions that were taken and the implemented activities for covering and terminating the commercial losses, in the period 2012-2015 the following results were achieved in connection with the commercial losses, which were forwarded for invoicing.

Project	2012	2013	2014	2015
Site networks		244 716	145 118	27 543
Surveys of water meter zones		3 855	374 195	15 550
Illegal water consumption	434 928	294 853	276 278	350 579
Replacement of water meters	89 342	110 321	121 540	129 311
Newly-installed water meters on buildings	50 197	10 618	60 651	78 215
Unread revenue meters for more than one year	97 310	37 120	149 553	131 179
Survey on customers with closed services	3 914		12 933	317
Survey on service connections		15 000	35 416	154 211
Campaigns in the suburban area		10 321	531 311	15 207
Total volume of m3 submitted for billing	675 691	726 804	1 706 995	902 112

It should be taken into consideration that the above-mentioned resuts are characterized with the following specifics, which were considered also at the forecast of the billed volumes for the period 2017-2021:

- throughout the years for each individual project there is not a clear tendency for similar levels of the results;

- the effect ‘fast wins’ in regard to some projects – the results are high at the start of the project but later significantly decrease
- decreasing of the consumption after calculation of initially big debts of the customers;
- completing some of the projects (site networks), forthcoming completing of other projects (newly-installed water meters on buildings in condominium regime) as well as periodic implementation of third projects (customers with closed services) some of which have a serious contribution to the total result;
- absence of historical data and results from the recently started projects;
- comparatively difficult predictability of the results from the field checks

The ratio between the amount of the decreased commercial losses and the share from it submitted for billing is given in the table below:

	2012	2013	2014	2015
Decreased commercial losses	**2 543 943**	**4 018 959**	**4 275 871**	**1 715 111**
Submitted for billing	**675 691**	**726 804**	**1 706 995**	**902 112**
	27%	**18%**	**40%**	**53%**

The increasing trend can be seen for the share of the commercial losses covered and submitted for billing for the specific year, as this % in 2015 reached 53%.

Based on the stated data for the amount of the commercial losses in the previous years and having in mind the characteristics related to the process of identifying and covering the commercial losses, Sofiyska Voda believes that the realistic amount of the commercial losses, which will be billed in the new regulatory period is as follows:

Measured commercial losses	**2017**	**2018**	**2019**	**2020**	**2021**
m3 commercial losses submitted for billing	**800 000**	**800 000**	**800 000**	**800 000**	**800 000**

The ratio of the forecast volumes of decreased commercial losses and their share which is forecast to be billed in the period of the BP 2017 - 2021 is as follows:

	2017	**2018**	**2019**	**2020**	**2021**
Decreased commercial losses	**501 217**	1 495 409	1 332 427	1 275 828	1 194 071
Submitted for billing	**800 000**	800 000	800 000	800 000	800 000
	160%	**53%**	**60%**	**63%**	**67%**

It can be seen from the above that for 2017 an unrealistic % is obtained (160%) for the share of the commercial losses, which will be submitted for billing versus the amount of the decreased volumes of commercial losses due to the following two reasons:

- The forecast data for the amount of the billed volumes for 2017 are based on the average value of the billed volumes for the period 2011 - 2015. Respectively this amount of the billed volumes has an impact also on the

amount of the physical losses and respectively the commercial losses (calculated as 30% of the physical losses), which has an effect in unrealistically low rate of decrease in the commercial losses in 2017 versus 2016;

- The second and more important reason is that for 2016 (as per the Instructions of the EWRC), the Company has set forecast data for 2016 from BP 2016. Thus in practice, for the calculation of the decrease in the commercial losses in 2017 the forecasts for 2016 are used, as these forecasts were prepared in 2015, which questions their accuracy. This leads to expected decrease in the commercial losses in 2017 by only 501,217 m3 and respectively this forecast distorts the % of the billed commercial losses. This can be seen from the table below:

	2015	BP 2016	2017
Q6 total losses m3	*72 497 537*	***67 833 384***	***66 162 660***
Commercial losses	*21 749 261*	***20 350 015***	***19 848 798***
Decreased commercial losses		***1 399 246***	***501 217***

On the other hand, however, to date available are the actual data for Q6 Total water losses till October 2016. The extrapolation for the entire 2016 (actual data for January – October and forecast for November – December) is much more specific and reliable base for the calculation of the commercial losses and their decrease than the data for BP 2016 submitted in 2015. Replacing the forecasts from BP 2016 with the actual data for 2016 (including the forecast for November - December 2016) we reach the forecast decrease in the commercial losses in 2017 by 1,151,202 m3, which is more specific and realistic figure as compared to 505,217 m3. The data are provided in the table below (a similar approach based on the actual data for 2016 the Company has used for making the forecasts for the billed volumes for water supply, sewerage and wastewater treatment):

	2015	BP 2016	2017
Q6 total losses m3	*72 497 537*	***70 000 000***	***66 162 660***
Commercial losses	*21 749 261*	***21 000 000***	***19 848 798***
Decrease in commercial losses		***749 261***	***1 151 202***

Using the data from the above table for calculation of the % of the billed commercial losses in 2017 versus 2016, we reach the following results, which we believe to be more specific baseline for the analysis of the contribution of the commercial losses to the increase in the billed volumes:

	2017	2018	2019	2020	2021
Decreased commercial	1 151 202	1 495 409	1 332 427	1 275 828	1 194 071

losses					
Submitted for billing	800 000	800 000	800 000	800 000	800 000
	69%	**53%**	**60%**	**63%**	**67%**

It can be seen from the above table that not only keeping the same amount of the billed volumes of commercial losses is expected for the period of the BP, but the expected drop in the amount of the decreased commercial losses on an annual basis will be compensated with the increase in the % of the commercial losses of 53% covered for billing in 2018 to 67% in 2021.

2.7. CONNECTION BETWEEN THE INCREASE OF DEBT COLLECTION AND THE REVENUES OF THE COMPANY

In Report No 2 the variables for calculation of the KPIs of the supplied WSS services, variables iG98 and iG97 are calculated in accordance with letter to EWRC CK-113/20.04.2016 (enclosed) as follows:

- The variable iG98 is presented as a difference between the revenue from services (with VAT and interest) for the reporting year and the sum of the collected receivables with VAT over the reporting year.

And respectively

- The variable iG97 is presented as a difference between the revenue from services (with VAT and interest) for the reporting year and the sum of the collected receivables with VAT over the reporting year.

Respectively regarding KPI12d Debt Collection in BP 2017 – 2021, in 2021 the company set achievement of the target level for the indicator.

3. PROPOSALS FOR PRICES AND REVENUES FROM THE WSS SERVICES INCLUDING ANALYSIS OF SOCIAL AFFORDABILITY

As a result of additional conversations with EWRC on 22.12.2016 Company prepared a new corrected version of the electronic models. As a result of the reductions in remunerations and benefits, the reduction in the costs for depreciation of off-balance sheet assets and the forecast for payment of dividends revised in January 2017, elecronic models, prices of WSS services decreased significantly compared to the prices of Revised Business Plan of November 2016 and they are as follows:

Prices of WSS services BGN/m3, VAT excluded	2017
WS Sofia:	
Price for water supply to customers	1,168
Price for sewerage	0,342
Price for wastewater treatment	
Domestic and equal to them customers	0,289

Industrial and other business customers	Level of pollution 1	0,329
	Level of pollution 2	0,578
	Level of pollution 3	0,722
WS Beli Iskar **– Price for water supply to other WSS operator**		0,090
WS Bozhurishte- Price for water supply to other WSS operator		0,392
WS Non-potable water - Price for water supply of non-potable water		0,539

Prices of WSS services BGN/m3, VAT excluded		2018	2019	2020	2021
WS Sofia:					
Price for water supply to customers		1,244	1,315	1,359	1,407
Price for sewerage		0,380	0,424	0,460	0,494
Price for wastewater treatment					
Domestic and equal to them customers.		0,308	0,319	0,325	0,339
Industrial and other business customers	Level of pollution 1	0,351	0,363	0,371	0,386
	Level of pollution 2	0,616	0,638	0,650	0,677
	Level of pollution 3	0,770	0,797	0,813	0,847
WS Beli Iskar **- Price for water supply to other WSS operator**		0,092	0,098	0,103	0,103
WS Bozhurishte- Price for water supply to other WSS operator		0,406	0,418	0,427	0,437
WS Non-potable water - Price for water supply of non-potable water		0,644	0,665	0,687	0,715

According to Report 13 from the revised electronic model of Business Plan 2017 -2021 the prices offered for the new regulatory period remain significantly below the social affordability.

Indicator	Measure	Report	Estimate					
		2015 г.	2016 г.	2017 г.	2018 г.	2019 г.	2020 г.	2021
Price for water supply to customers	BGN/m^3 (*VAT excluded*)	0,99	1,20	1,17	1,24	1,31	1,36	1,41
Price for sewerage	BGN/m^3 (*VAT excluded*))	0,20	0,26	0,34	0,38	0,42	0,46	0,49
Price for wastewater treatment	BGN/m^3 (*VAT excluded*)	0,28	0,30	0,29	0,31	0,32	0,33	0,34
Total:	**BGN/m^3 (*VAT excluded*)**	**1,76**	**2,11**	**2,16**	**2,32**	**2,47**	**2,57**	**2,69**
Minimum domestic consumption	m^3/month per person	2,80	2,80	2,80	2,80	2,80	2,80	2,80

Minimum monthly water consumption per household member	BGN	4,94	5,91	6,04	6,49	6,91	7,21	7,53
Average monthly income per person in a household within the area	BGN for month	588	603,29	623,80	645,01	666,94	689,62	713,0
Growth of GDP according to medium-term budget forecast 2015 - 2017.	%		2,60%	3,40%	3,40%	3,40%	3,40%	3,40%
2.5 % from average monthly income per a person in a household	BGN	14,70	15,08	15,59	16,13	16,67	17,24	17,8
Social affordability of prices for WSS services	**BGN/м3**	**5,25**	**5,39**	**5,57**	**5,76**	**5,95**	**6,16**	**6,37**

Below are presented the prices of WSS services according to the revised in November 2016 Business Plan, before the corrections in the electronic models in January:

WS Sofia

As per the electronic model for WS Sofia, Report 20 the proposed prices by service for the new regulatory period are as follows:

For water supply service

№	Group of customers	Measure	Water supply to customers				
			2017	2018	2019	2020	2021
1	**Domestic and equal to them customers**	BGN/m³	**1,255**	**1,336**	**1,408**	**1,460**	**1,506**
2	**Industrial and other business customers**						
2.1	Level of pollution 1	BGN/m³					
2.2	Level of pollution 2	BGN/m³					
2.3	Level of pollution 3	BGN/m³					

For sewerage service

№	Group of customers	Measure	Sewerage				
			2017	2018	2019	2020	2021
1	**Domestic and equal to them customers**	BGN/m³	**0,378**	**0,418**	**0,462**	**0,501**	**0,533**
2	**Industrial and other business customers**						
2.1	Level of pollution 1	BGN/m³					
2.2	Level of pollution 2	BGN/m³					
2.3	Level of pollution 3	BGN/m³					

For wastewater treatment service

№	Group of customers	Measure	Wastewater treatment				
			2017	2018	2019	2020	2021
1	**Domestic and equal to them customers**	BGN/m^3	**0,310**	**0,330**	**0,340**	**0,343**	**0,341**
2	**Industrial and other business customers**						
2.1	Level of pollution 1	BGN/m^3	0,353	0,376	0,388	0,391	0,389
2.2	Level of pollution 2	BGN/m^3	0,619	0,659	0,681	0,687	0,683
2.3	Level of pollution 3	BGN/m^3	0,774	0,824	0,851	0,858	0,853

According to Report № 13 from the e-model of BP 2017 - 2021 the proposed prices for the new regulatory period remain significantly below the threshold of social affordability:

Indicator	Measure	Report	Estimate					
		2015	2016	2017	2018	2019	2020	2021
Price for water supply to customers	BGN/m^3 (*VAT excluded*)	0,99	1,20	1,26	1,34	1,41	1,46	1,51
Price for sewerage	BGN/m^3 (*VAT excluded*)	0,20	0,26	0,38	0,42	0,46	0,50	0,53
Price for wastewater treatment	BGN/m^3 (*VAT excluded*)	0,28	0,30	0,31	0,33	0,34	0,34	0,34
Total:	BGN/m^3 (*VAT included*)	**1,76**	**2,11**	**2,33**	**2,50**	**2,65**	**2,76**	**2,86**
Minimum domestic consumption	M3/month. per 1 man	2,80	2,80	2,80	2,80	2,80	2,80	2,80
Minimum monthly water consumption per household member	BGN	4,94	5,91	6,53	7,00	7,43	7,74	8,00
Average monthly income per person in a household within the area	BGN for month	588	603,29	623,80	645,01	666,94	689,62	713,06
Growth of GDP according to medium-term budget forecast 2015 - 2017.	%		2,60%	3,40%	3,40%	3,40%	3,40%	3,40%
2.5 % from average monthly income per a person in a household	BGN	14,70	15,08	15,59	16,13	16,67	17,24	17,83
Social affordability of prices for WSS services	**BGN/м3**	**5,25**	**5,39**	**5,57**	**5,76**	**5,95**	**6,16**	**6,37**
Social affordability of prices for WSS services	**%**	**0,84%**	**0,98%**	**1,05%**	**1,09%**	**1,11%**	**1,12%**	**1,12%**

Note: The stated income per capita in a household of BGN 588 is in accordance with the enclosed report from the NSI for 2015

WS Beli Iskar

The proposed prices for water system Beli Iskar for water supply to ViK EOOD, Sofia - Samokov are:

№	Group of customers	Measure	Water supply				
			2017	2018	2019	2020	2021
1	**Domestic and equal to them customers**	BGN/m^3	**0,091**	**0,093**	**0,098**	**0,104**	**0,104**
2	**Industrial and other business customers**						
2.1	Level of pollution 1	BGN/m^3					
2.2	Level of pollution 2	BGN/m^3					
2.3	Level of pollution 3	BGN/m^3					

WS Bozhurishte

The proposed prices for water system Bozhurishte for water supply to ViK EOOD, Sofia – Bozhurishte are:

№	Group of customers	Measure	Water supply				
			2017	2018	2019	2020	2021
1	**Domestic and equal to them customers**	BGN/m^3	**0,392**	**0,407**	**0,419**	**0,428**	**0,439**
2	**Industrial and other business customers**						
2.1	Level of pollution 1	BGN/m^3					
2.2	Level of pollution 2	BGN/m^3					
2.3	Level of pollution 3	BGN/m^3					

WS Non-potable

The proposed prices for non-potable water supply are:

№	Group of customers	Measure	Water supply				
			2017	2018.	2019	2020	2021
1	**Domestic and equal to them customers**	BGN/m^3	**0,549**	**0,657**	**0,679**	**0,703**	**0,732**
2	**Industrial and other business customers**						
2.1	Level of pollution 1	BGN/m^3					
2.2	Level of pollution 2	BGN/m^3					
2.3	Level of pollution 3	BGN/m^3					

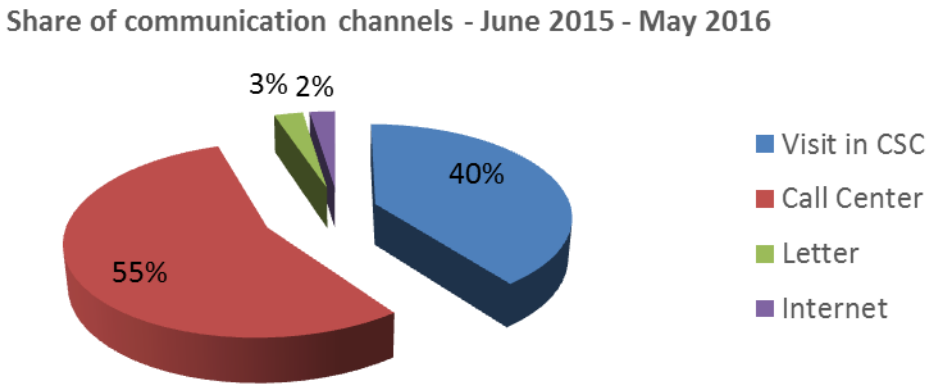
4. ANALYSIS OF THE COMPLAINTS OF CUSTOMERS OF THE WSS OPERATOR AND PLAN FOR IMPROVING CUSTOMER SERVICE

With the implementation of the new customer information system in March 2015, it has become possible to have an overview on all customer contacts, irrespective of the communication channel and based on a unique classification of contacts. Up to that

moment, all analysis had been performed only on written correspondence, which does not represent the main communication channel with the customers.

Since the system was implemented in March 2015, we cannot present the full data for 2015, so the below analysis will be performed on a yearly basis, but for the interval June 2015 – May 2016.

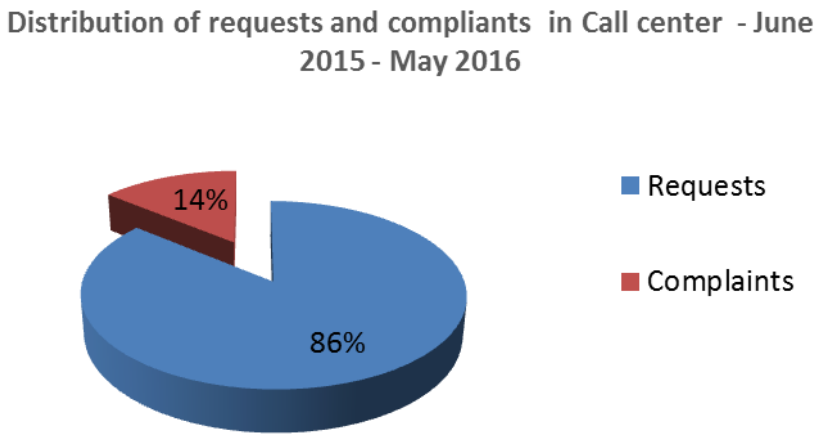
As a preliminary remark, we would like to point out the respective shares of each communication channel with the customers from the total received contacts:



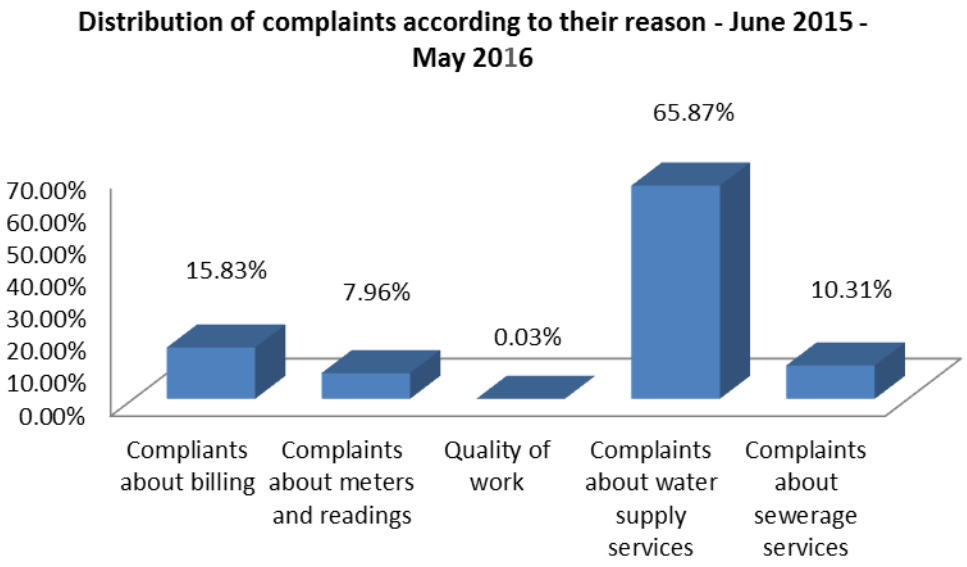
Due to the specific classification of contacts by types of requests and complaints, we can monitor for the period, for each channel, the respective distribution per type of contact:

a) For the call center

- Below is the chart which shows the comparison between the request and complaints received in the call center for the period June 2015 – May 2016.

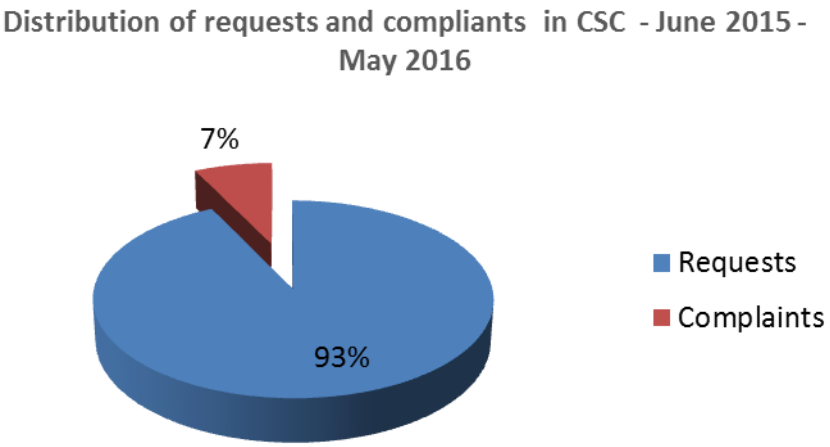


All complaints from customers are distributed into 5 main categories (contact classes) which combine specific reasons for complaints. The following chart shows the distribution of the complaints in the 5 classes. The biggest part is for the complaints about water supply services.

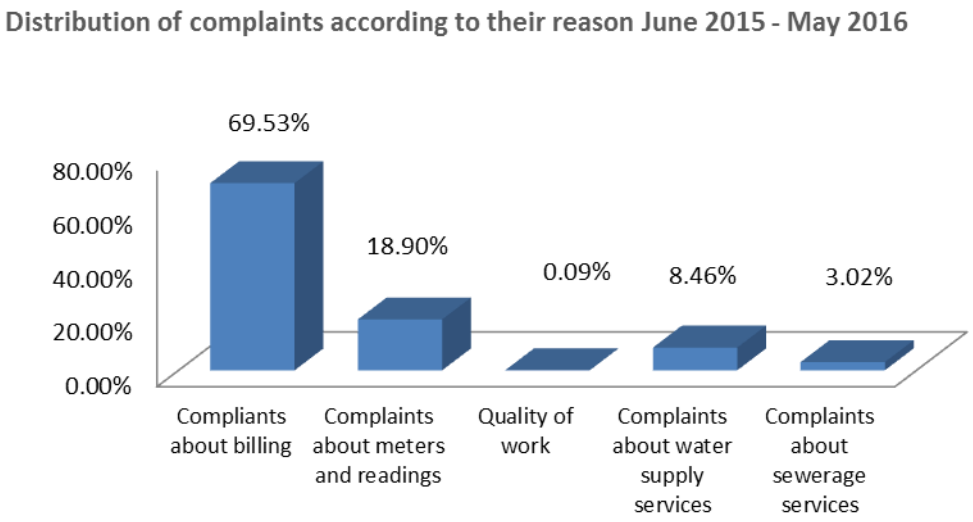


b) For the Customer Service Centers

- Below is the chart which shows the comparison between the request and complaints received in the Customer Service Centers for the period June 2015 – May 2016.

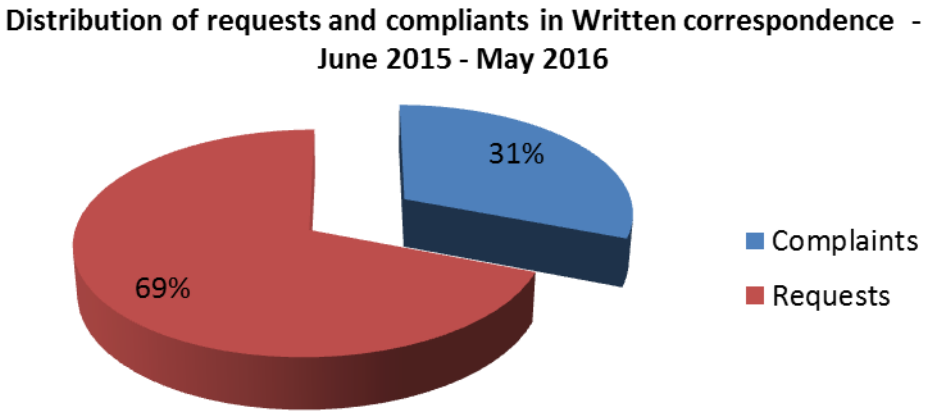


The following chart shows the distribution of the complaints in the 5 classes for the CSC. The biggest part is for the complaints about billing.



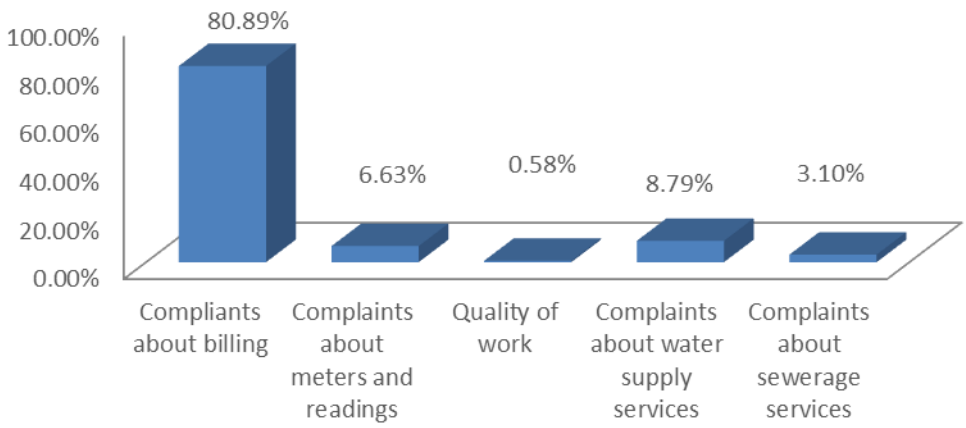
c) For written correspondence

- Below is the chart which shows the comparison between the request and complaints received in the written correspondence for the period June 2015 – May 2016.



The following chart shows the distribution of the complaints in the 5 classes for the Written Correspondence. The biggest part is for the complaints about billing.

Distribution of complaints according to their reason - June 2015 - May 2016



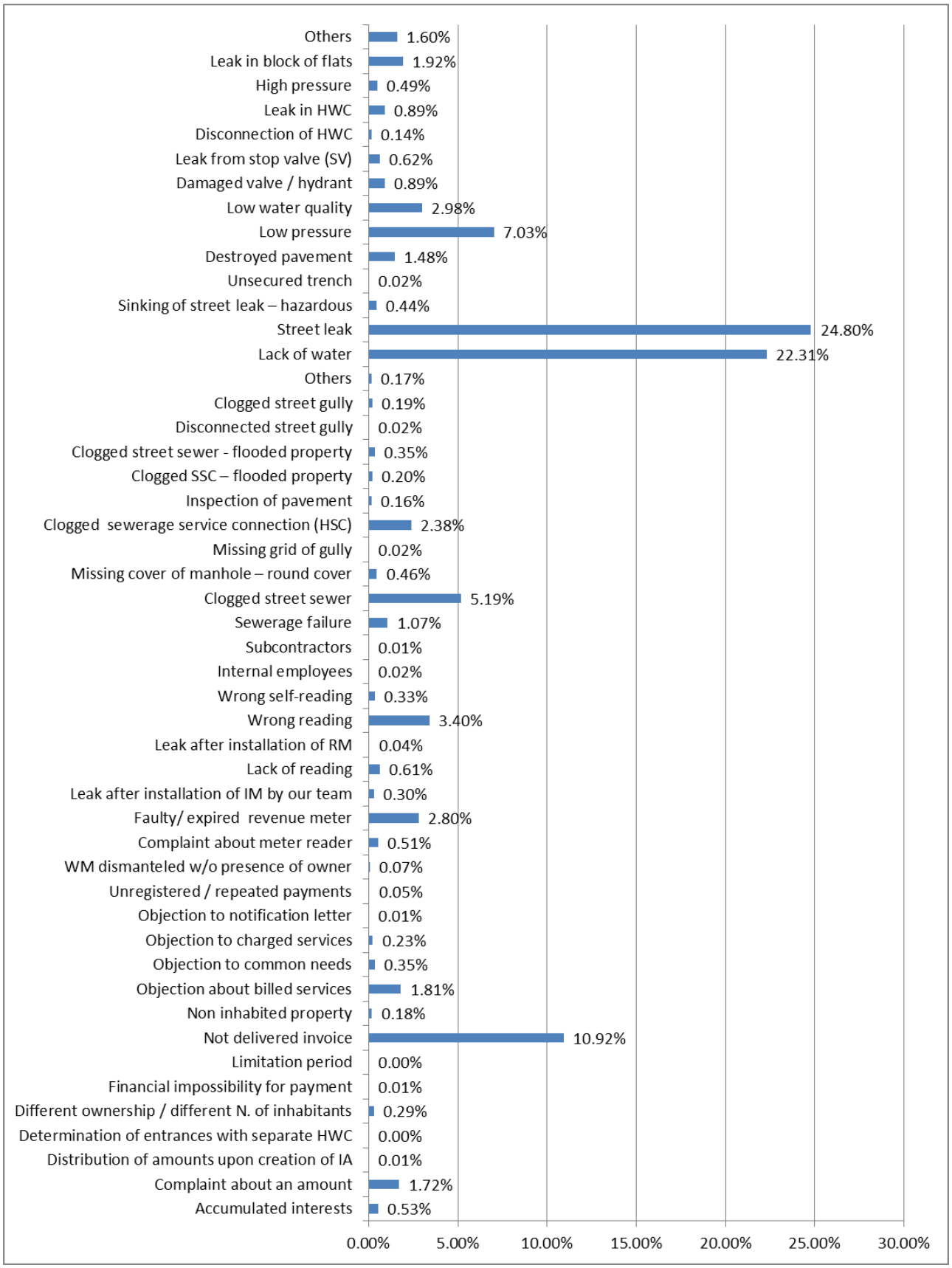
We can see from the analysis of all contacts per communication channel that:

- The share of complaints from the total number of contacts stays at a low level; this means that most of the time when the customers contact us is not for showing a dissatisfaction with regard to our services
- The distribution of complaints requests per type differs by communication channels

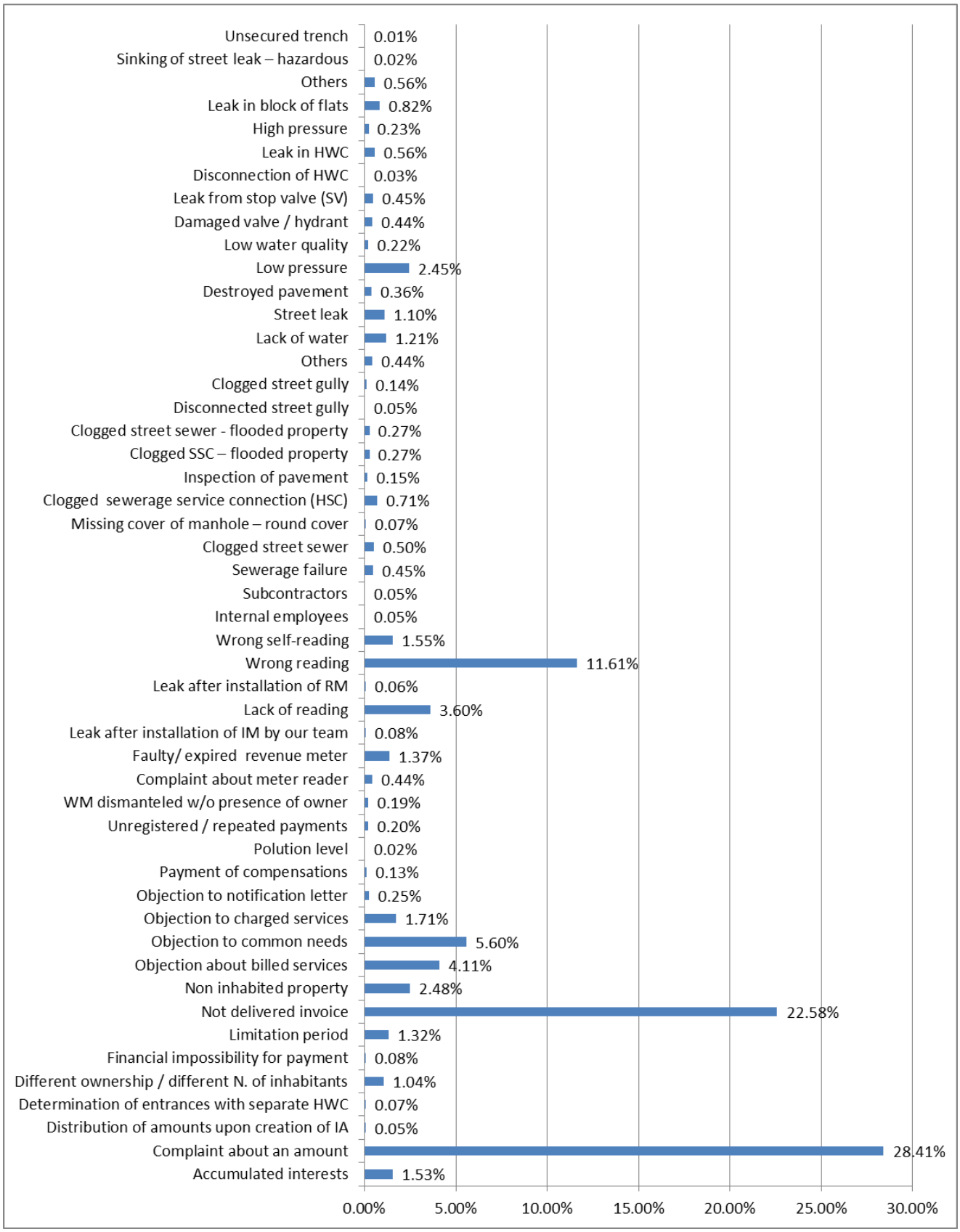
For the Call center as a communication channel the biggest part are the complaints about water supply services. For CSC and written correspondence the biggest part of the complaints are about billing.

The complaints can be further analyzed by sub-categories, as follows:

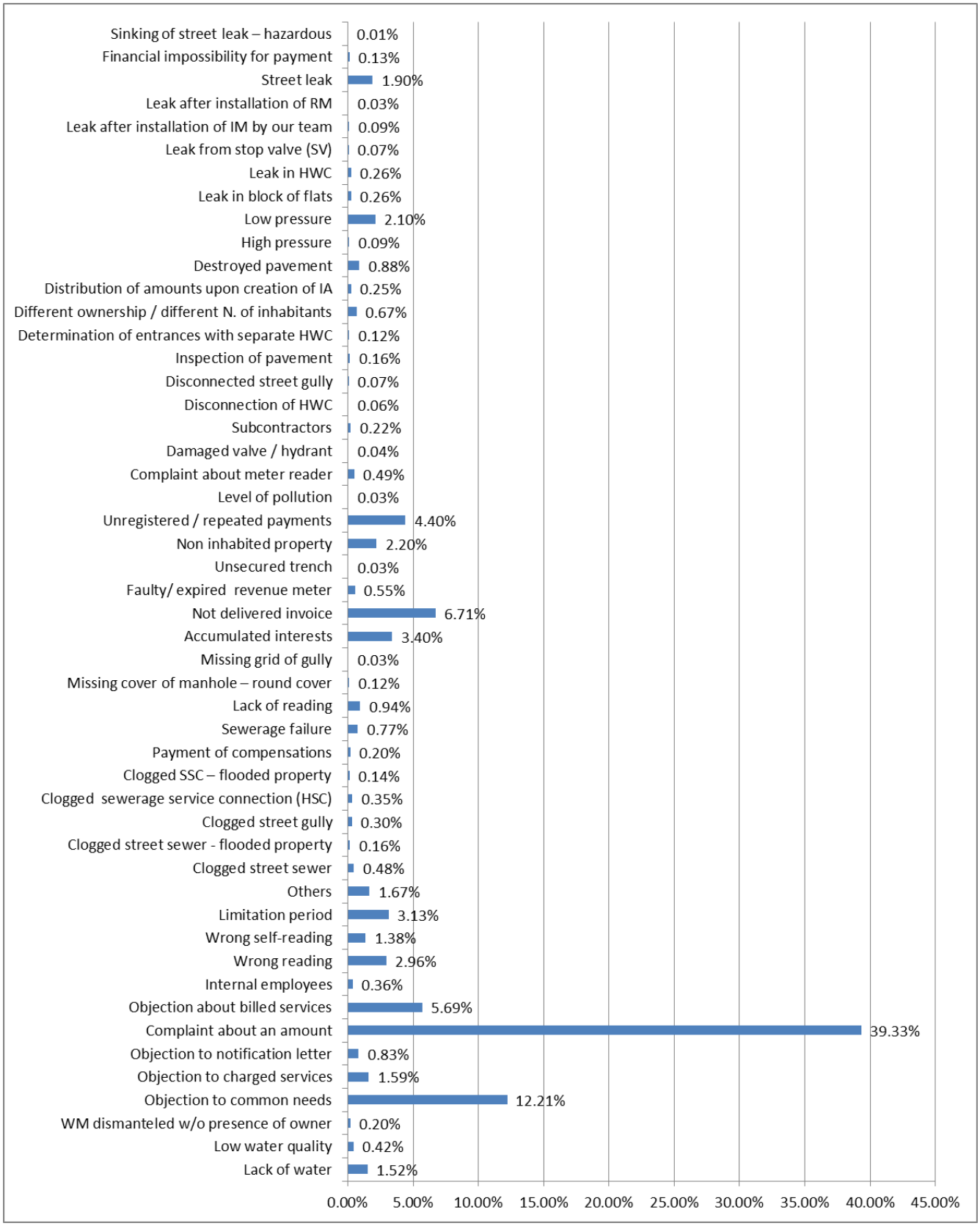
- For call center – the biggest part from the complaints is for the Street leak with 24.8% and lack of water with 22.31%.



- For CSC – the biggest part of the complaints from customers are for the Complaint about an amount with 28.41% followed by Not delivered invoice with 22.58%.


Unsecured trench 0.01%
Sinking of street leak – hazardous 0.02%
Others 0.56%
Leak in block of flats 0.82%
High pressure 0.23%
Leak in HWC 0.56%
Disconnection of HWC 0.03%
Leak from stop valve (SV) 0.45%
Damaged valve / hydrant 0.44%
Low water quality 0.22%
Low pressure 2.45%
Destroyed pavement 0.36%
Street leak 1.10%
Lack of water 1.21%
Others 0.44%
Clogged street gully 0.14%
Disconnected street gully 0.05%
Clogged street sewer - flooded property 0.27%
Clogged SSC – flooded property 0.27%
Inspection of pavement 0.15%
Clogged sewerage service connection (HSC) 0.71%
Missing cover of manhole – round cover 0.07%
Clogged street sewer 0.50%
Sewerage failure 0.45%
Subcontractors 0.05%
Internal employees 0.05%
Wrong self-reading 1.55%
Wrong reading 11.61%
Leak after installation of RM 0.06%
Lack of reading 3.60%
Leak after installation of IM by our team 0.08%
Faulty/ expired revenue meter 1.37%
Complaint about meter reader 0.44%
WM dismanteled w/o presence of owner 0.19%
Unregistered / repeated payments 0.20%
Polution level 0.02%
Payment of compensations 0.13%
Objection to notification letter 0.25%
Objection to charged services 1.71%
Objection to common needs 5.60%
Objection about billed services 4.11%
Non inhabited property 2.48%
Not delivered invoice 22.58%
Limitation period 1.32%
Financial impossibility for payment 0.08%
Different ownership / different N. of inhabitants 1.04%
Determination of entrances with separate HWC 0.07%
Distribution of amounts upon creation of IA 0.05%
Complaint about an amount 28.41%
Accumulated interests 1.53%
0.00% 5.00% 10.00% 15.00% 20.00% 25.00% 30.00%

- For written correspondence – the biggest is the part of the complaints about an amount – 39.33%, followed by complaints about common needs with 12.21%



Monitoring of the level of the customer complaints compared to the total number of contacts is also set as KPI for the newly implemented Quality Management System, as we have input target level not to exceed 20% on monthly basis.

Sofiyska Voda performs monthly analysis of customer contacts, with the aim of reducing not only the complaints, but also other types of contacts which can be considered not necessary and cumbersome for the customers. The aim is to be able to provide such information in advance to customers, without waiting for the customer to contact us.

The plan for improving the customer service has been presented in detail in point 5.13 of the Business Plan. In addition to what has been already stated, we can add the systematic monitoring and analysis of the customer contacts as one constant method for measuring customer satisfaction and detecting the areas of improvement.

V. IMPLEMENTATION OF THE BUSINESS PLAN

1. SCHEDULE FOR IMPLEMENTATION OF REGISTERS, SYSTEMS AND DATABASE

In the schedule below is given information for new systems and applications as well as data for new versions of existing systems and software. The implementation of new versions is aiming to improve the functionality of the current software in order to improve the work processes and also the quality of data for these processes which are monitored, registered and controlled by the systems.

№	New system/ register/ database/ new version	Planned deadline for implementation
1	System for integrated enterprise resource planning (ERP system)	2019
2	SAP BW & DR - application for generating all types of reports from the implemented customer information system SAP	2017
3	Integrated system for the needs of the Call Centre	Second half of 2017
4	New software application for laboratory management	2019

5	Development of the functionality of the software application Pegasus - system for registration and reporting failures on WS&S network	2017 - 2021 (planned separate stages of development for every year of the period)
6	Development of SCADA system for water supply, sewerage and wastewater treatment, incl. building a system for real time monitoring and visualization of the quality indicators of the potable water, system for energy management and connection of new sites to the system	2017 - 2021 (planned separate stages of development for every year of the period)
7	System for monitoring and management of water metering zones along the water supply network	2018
8	Development of Geographical Information System (GIS) and provision/ purchase of main data for cadaster and regulation by an external supplier	2017 - 2021 (planned separate stages of development for every year of the period)

2. SCHEDULE FOR IMPLEMENTATION OF MANAGAMENT SYSTEMS

№	New management system/ new version of management system	Implemented management system	Planned deadline for implementation
1	1.1.БДС EN ISO 9001:2015 - Quality Management Systems – customer service processes 1.2. БДС EN ISO 9001:2015 – all activities in the company	-	1.1 June 2016 1.2 December 2018
2	Re-certification and transfer to the new version of ISO 14001:2015	БДС EN ISO 14001:2005 - Environmental Management Systems - implemented December 2008	November 2017
3	Re-certification and transfer to ISO 45001:2016	БДС BS OHSAS 18001:2007 - Occupational Health and Safety Management Systems - implemented January 2009	November 2017

3. SCHEDULE FOR INTRODUCTION OF THE UNIFORM REGULATORY REPORTING SYSTEM

As per art. 34, para 7 of the **Ordinance on the prices**, the rules of the URRS, the chart of accounts and the annual financial statement are applied not earlier than the start of the calendar year following the date of their approval – respectively the start of 2017. In compliance with it the company plans the following steps for introduction of URRS, which will be specified in terms of deadlines in the months following the filing of BP 2017-2021 and after the conduct of working meeting with system integrators /suppliers

- Analysis of the software platform provision for maximum efficiency and optimization of the cost at the use of the existing accounting platform AJUR;
- Implementing an additional installation for the needs of the URRS on the software platform in parallel with the existing installation for the needs of UAS for comparison purposes of the accounting operations, total amount of the costs and the book values of the assets;
- Setting a new chart of accounts in the installation for the needs of the URRS;
- Analysis and development of a solution for automatic transfer of operations from the UAS to URRS in compliance with the new chart of accounts for URRS;
- Analysis and development of modules for automatic reports in formats, required by the URRS;
- Analysis and development of system modules for automatic application of percent for distribution of costs and assets in compliance with the principles of the URRS;
- Recalculation of the accumulated depreciations of the assets as at 31.12.2016 in compliance with the instructed in the Uniform Regulatory Reporting System depreciation rates for the relevant groups of assets;
- Conducting tests and comparison of the results between Uniform Regulatory Reporting System and the UAS

4. INVESTMENT PROGRAM IMPLEMENTATION SCHEDULE

The investment program implementation schedule depends on several factors:

- Importance and urgency of the projects in view of the normal operation of the WSS systems and achievement and/or maintenance of the aimed levels of the KPIs.
- Presence of a feasibility study and project preparedness (including deadlines for various administrative procedures) for the physical realization of the projects
- Observed trends in the intensity of different operational requirements
- Investment priorities of the Grantor
- Possibility to secure by financial means

The distribution of investments for WS for potable water according to years is in compliance with the factors listed above and is presented in Report 9 “Investment Program” of the price model.

In a summary the distribution of the investments for WS potable water is as follows:

Distribution of investments according to services for the period 2017 - 2021	2017 (thousand BGN)	2018 (thousand BGN)	2019 (thousand BGN)	2020 (thousand BGN)	2021 (thousand BGN)
Water supply	27 726	24 311	23 372	19 754	21 023
Sewerage	12 148	13 840	11 667	11 104	10 323
Treatment	3 589	5 584	3 045	2 281	996
Total investments:	**43 463**	**43 735**	**38 084**	**33 139**	**32 342**

5. TIMETABLE FOR THE IMPROVEMENT QUALITY OF INFORMATION ABOUT THE QUALITY KPIs

Sofiyska Voda JSC maintains a high quality of data on key indicators. The information is taken from specialized software, such as: Customer Information System - SAP, Geographic Information System– GIS, software for recording and management of operational events- Pegasus, specialized software for the HR - Style, Archimed, SCADA.

In order to improve the business processes the Company plans during the 5-year regulatory period to improve the functionality of some of its software applications as well as introducing new ones such as: integrated system for the Call Centre, a new software development for laboratory management, etc. The introduction of an ERP system for integrated resource planning, will provide for further automating of the internal business processes, including those related to the generation and reporting of the data regarding the key performance indicators of water and sewerage services. This process will contribute to improving the quality of information provided on key indicators and will increase the opportunities for regular analysis of the same, as practice exists in Sofiyska Voda JSC for several years.

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6. TIMETABLE FOR THE ACHIEVEMENT OF THE KPIs FOR THE QUALITY OF WSS SERVICES

The timetable for the achievement of the individual levels of KPIs according to the Decision of EWRC №ПК-1/22.06.2016, is presented in the Appendix 2 and Appendix 3.

The expectations of the company are that at the end of 2021 it will reach the preset by EWRC levels of the quality indicators provided the availability of financial resources to ensure the planned investment and operating costs. The planned reaching of the individual levels of the key quality indicators by years is presented in the table below:

№	KPI	Parameter	2017	2018	2019	2020	2021	Individual goal for 2021
1	**KPI1**	Level of coverage of water supply services	100.00%	100.00%	100.00%	100.00%	100.00%	99%
2	**KPI2a**	Quality of potable water in large water supply areas	99.00%	99.00%	99.00%	99.00%	99.00%	99%
3	**KPI2b**	Quality of potable water in small water supply areas	98.06%	98.08%	98.06%	98.06%	98.06%	98%
4	**KPI2c**	Monitoring of the quality of potable water	100.00%	100.00%	100.00%	100.00%	100.00%	100%
5	**KPI3**	Continuity of water supply	0.49	0.48	0.47	0.47	0.47	-
6	**KPI4a**	Total water losses in the water supply systems	51.92	48.19	44.88	41.70	38.72	45.59
7	**KPI4b**	Total water losses in the water supply systems	47.02%	45.31%	43.46%	41.65%	39.84%	42.22%
8	**KPI5**	Failures on the water supply network	99.31	96.27	93.22	90.18	87.13	87.13
9	**KPI6a**	Pressure in the water supply system	95.63%	96.12%	97.09%	97.57%	98.06%	80%
10	**KPI7a**	Level of coverage of sewerage service	95.04%	95.33%	95.69%	96.09%	96.48%	-
11	**KPI7b**	Level of coverage of wastewater treatment service	89.91%	90.23%	90.62%	91.05%	91.47%	-
12	**KPI8**	Quality of wastewater	100.00%	100.00%	100.00%	100.00%	100.00%	93%
13	**KPI9**	Failures on the sewerage network	162.61	161.26	160.29	159.54	159.24	159.24
14	**KPI10**	Floods in the properties of third parties, caused by the sewerage network	0.14	0.12	0.12	0.11	0.11	-
15	**KPI11a**	Energy efficiency of water supply activity	0.03	0.03	0.03	0.03	0.03	0.03
16	**KPI11b**	Energy efficiency of wastewater treatment activity	0.1310	0.1307	0.1305	0.1305	0.1305	-
17	**KPI11c**	Utilization of sludge from wastewater treatment plants (WWTP)	100.00%	100.00%	100.00%	100.00%	100.00%	90%
18	**KPI11d**	Rehabilitation of the water supply network	1.17%	1.04%	1.06%	1.08%	1.09%	1.09%
19	**KPI11e**	Active control of leaks	17.33%	18.01%	18.66%	19.32%	20.00%	16.02%
20	**KPI12a**	Cost-effectiveness of the water supply service	1.67	1.74	1.81	1.88	1.93	1.1
21	**KPI12b**	Cost-effectiveness of the sewerage service	2.35	2.61	2.77	2.92	3.01	1.1
22	**KPI12c**	Cost-effectiveness of the wastewater treatment service	1.33	1.38	1.41	1.43	1.44	1.1
23	**KPI12d**	Collection rate	95.67%	95.69%	95.69%	95.69%	95.70%	95.70%
24	**KPI12e**	Efficiency of setting the water meters in validity	16.50%	16.43%	16.35%	16.27%	16.19%	14%
25	**KPI12f**	Efficiency of establishment of the revenue meters	92.62%	90.72%	86.54%	86.12%	88.10%	87.83%
26	**KPI13**	Deadline for responding to written customer complaints	100.00%	100.00%	100.00%	100.00%	100.00%	100%
27	**KPI14a**	Connection to the water supply system	99.38%	99.70%	99.71%	100.00%	100.00%	100%
28	**KPI14b**	Connection to the sewerage system	99.49%	99.49%	99.49%	100.00%	100.00%	100%
29	**KPI15a**	Staff efficiency with regard to the water supply service	5.81	5.83	5.83	5.83	5.84	6.01
30	**KPI15b**	Staff efficiency with regard to the sewerage and wastewater treatment services	4.14	4.13	4.13	4.13	4.12	4.18

7. SCHEDULE FOR WATER LOSSES REDUCTION

For the next regulatory period a number of measures were provided for, aiming at the optimization of the network, improvement of the network management and efficiency and decrease in the number of failures and physical water losses.

The measures which are constantly implemented are:

- **Optimization of the network zoning** – optimization, balance and change of the existing network zoning. When zoning was done in the period 2008-2010 more than 500 boundary valves were used – some of them disconnect strategic water mains and/or create long closed sections (dead ends). The strategy for durable and reliable zoning is to separate the strategic water mains without boundary valves on them and decrease in the dead-end sections through reconstructions of the network in the boundary areas, as well as analyzing the existing zones and corrections of their boundaries where it is needed.

- **Effective measurement of water volumes and pressure** – it consists of determination of the measuring points where the data from the measurements are not with the needed accuracy and reliability. Since the efforts of the Company in the recent years are focused on effective and reliable measurement, there are already enough measurements on the network, through which the critical sections could be found. The options for correcting the arising disruptions are replacement of the device itself with a new one, with a device of another type, or fully with a new generation of devices, reconstruction of a given measurement point or overall change of the measurement place;

- **Establishment and development of the SCADA and Telemetry** – the development of the system consists of constant seeking of the optimal option for price-quality-possibilities of the products offered at the market. The compatibility of the new systems with the already existing ones is also a challenge at the selection of a technology. The extension of the coverage of the sites is provided for in the next regulatory period, which are monitored in real time, as inlets of DMAs are added to the already existing ones, the number of the pressure reducing valves is increased, new key points on the network, etc.

- **Study and optimization of the network** – the study of the water network is a constant process, affecting almost all remaining projects, as the main objective is the good knowledge and optimization of the system. The performed activities are civil works for studying purposes on the network, optimization of the work of the PSs, hydrophores and reservoirs, survey of the hydraulic and operational data, etc.

  Along with that the network optimization will continue through the construction of connections between the water mains, disconnecting of duplicate water mains, installation of stop valves in order to limit the zones for water supply interruption at performing civil works, ensuring the required water circulation, eliminating the risks of appearance of deviations in the water quality, better management of the supplied volumes, etc.

- **Pressure management** – This project has 2 strategic objectives – reduction of the physical losses (the water flowing out at failures, as well as the number of the failures) and gradual achievement of the levels of work pressure in the statutory documents since under the Urban Development Plan for Sofia, the network was designed and constructed for considerable higher pressure. Since the long-term project for the formation of zones with pressure management will be finalized this year, the activities under the project will be reduced to maintenance of the already established system, upgrade of part of the reducing valves with a system for dynamic pressure management, formation of small zones for resolving local problems, change of boundaries where and if necessary, etc.

- **Active leak control** – finding the hidden defects and failures on the network will be the tool of more and more importance for the losses reduction. New technologies are to be implemented for detecting the hidden leaks, with which the time for finding the arising failures will be considerably decreased. At the same time the new technologies will allow finding leaks which at present cannot be detected with the existing equipment.

- **Detail survey of the DMAs with high minimum night flow** – the project started in 2014, as the survey is done simultaneously by different departments of the Company involved in the losses reduction – physical and commercial. The project objective is the DMAs with high losses, as the results from each zone have been so far more than positive and the project will continue for a long time without interruption. In addition to the measures for losses reduction, the project gives result also in finding the imperfections in the work of the network, eliminating the hydraulic and operational problems, etc.

- **Replacement of street water mains** – as part of the investment program of the Company, following an analysis and assessment of the water mains, those are replaced, which have the highest level of depreciation and the leaks on them appear with the highest frequency. Thus on the one hand the physical losses on the network are decreased, and on the other hand – the quality of the provided service is enhanced through preventing the option of occurrence of failures, whose repair leads to water supply interruption for the customers supplied from the water main. At the same time, not all water mains are replaced only with the purpose of reducing the losses. Big part of their replacement is focused on enhancing the quality of the provided service, eliminating the problems concerning pressure, lack of water, worsened water quality, etc.

- **Replacement of short sections of the water network** – through the replacement of short sections from the water network the future arising of failures is prevented in sections, which are exposed to aggressive influences –

electrochemical corrosion, highly aggressive environment, faults and manufacturing defects in the segments of a given section, etc. When it is possible, the entire faulty segment of the water main is replaced instead of repairing the local failure arising on it.

- **Replacement and installation of stop valves** – since the stop valves are the key instrument for network management, their good order is of key importance for limiting the zones affected by the water supply interruption at repairing failures, for creating a possibility and implementing alternative water supply schemes and also making tests and measurements. Apart from replacing the faulty and depreciated stop valves, along with it new ones are installed where it is necessary for the proper network management.

- **Replacement of water service connections** – house connections, apart from creating prerequisites for the appearance of leaks in the residential buildings, have a direct impact on the quality of the provided service, especially for residential buildings with big number of inhabitants. In addition, for the buildings, whose high zones are supplied through hydrophores, each failure leads to continuous work of the pumping units, higher level of losses and higher consumption of electric power. Due to these reasons Sofiyska Voda continues to replace the depreciated water service connections and also the ones with comparatively high number of the failures.

- **Establishment of hydraulic network models** – the computer models are a modern model for water network analysis and optimization. They are a dynamic database for integration of the technical and operational information for the network and a powerful tool in planning activities for the improvement of the network condition, respectively for decrease in the water volumes, and all that in a safe software environment.
  The hydraulic model allows checking the work of the system, simulation of different events and their impact on the normal functioning of the system. At the same time, the hydraulic model allows finding the hidden defects in the network, as closed or half-closed stop valves, unknown connections between the water mains, connections between the DMAs, etc.
  The hydraulic model of the sewer network enables, from the point of view of losses reduction, joint projects for study/ analysis / modelling of the work of the two networks (water and sewer), and finding infiltrations from potable water in the sewer network.

- In the next regulatory period the following new individual activities and projects have been provided for, which will allow to keep the trend in the losses reduction:

- **Actual use of the water network hydraulic model –** the model is expected to be calibrated and put in actual use at the beginning of 2017.

- **Purchase of equipment for detecting hidden leaks with the use of helium** – at the beginning of 2017 the above method will be tested as it will improve considerably the leak detection, especially in the routes without pavement, noisy environment, weak leaks, etc.;

- **Systems for dynamic pressure management** – following the installation of the test devices in 2015 and the shown positive results, such systems are to be installed on the existing reducing valves where their effect will be the highest. The project is a long-term one until the exhaustion of all its possibilities.

- **Fixed noise-recording and correlating loggers** – the first test of the system from correlating and noise-recording loggers will be made this year. In view of the positive effects from the WSS operators in Europe, their implementation stage by stage in our country as well is planned, as the first own loggers will be purchased and installed in 2017 in the zones with high number of failures and respectively – with high level of the losses. It is expected that the number of the installed devices will increase gradually as the final objective is the critical zones relevant for each year to be constantly equipped with them.

- **Survey of the consumption –** the need of surveying the consumption to date is obvious, therefore the project should be organized and started in 2017. The results will allow not only the receipt of data for the trends in the consumption and but also better prioritization of the methods for losses reduction – actual and commercial.

- **Software for online network monitoring –** the need of purchasing sucg software is more and more pressing because at present the weekly balances of the DMAs are prepared in a quite complex way and with a lot of manual work. Such software could optimize the process considerably, will allow the preparation of the daily balances of the DMAs, which on its part will reduce considerably the time for detecting the leaks or defects in the functioning of the network. In addition, the existence of tools for analyses, which are present in such types of products, will improve significantly the finding and prioritizing the problematic zones in the network. Software is expected to be implemented and commissioned in 2018.

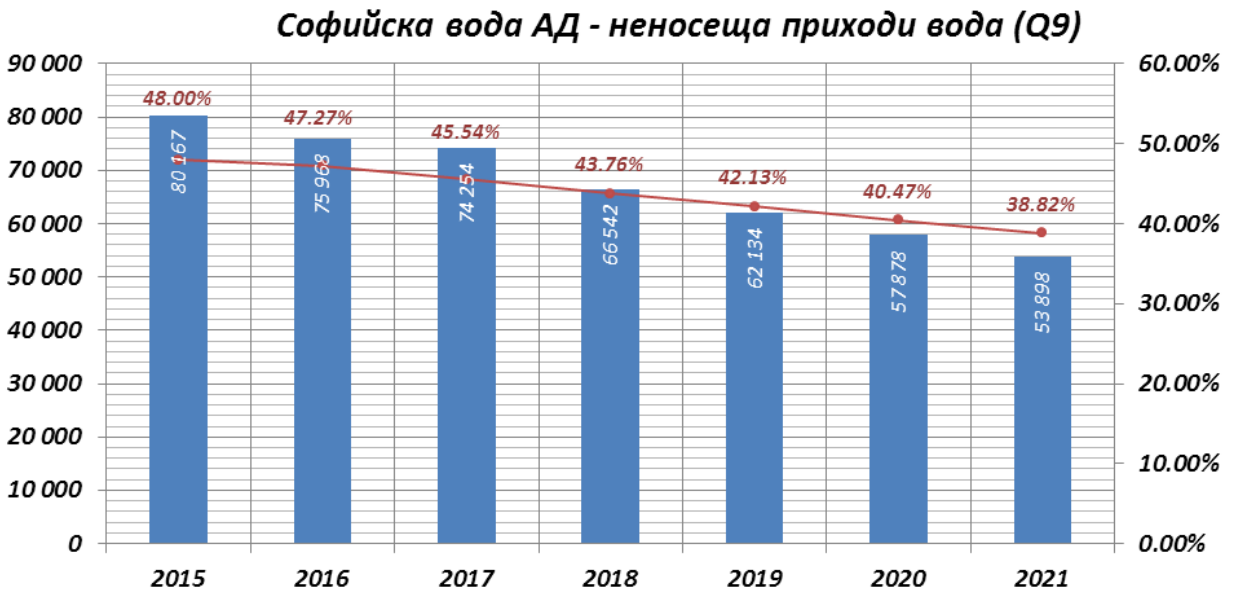
- **System for CCTV inspection and noise recording of pressure water mains –** such system was tested in 2015 and the results were more than promising. The possibility of visual survey of the water network, along with the survey for leaks will allow finding unknown connections, level of depreciation, available

leaks, change in diameters, existing old fittings, etc. The start of the project and the purchase of the required equipment is planned for 2018.

In view of all carried out and planned measures, it is expected till the end of the period 2017-2021 the achieved target level of the losses to be as follows:

		2015	2016	2017	2018	2019	2020	2021
ВС Бели Искър	Вход система (хил. м3)	44 248	46 000	46 000	46 000	46 000	46 000	46 000
	Отдадени количества към ВС София (хил. м3)	35 614	37 384	36 762	36 651	36 957	37 113	37 269
	Фактурирани количества (хил. м3)	7 282	6 546	7 168	7 279	6 973	6 817	6 661
	Загуби (хил. м3)	1 352	2 070	2 070	2 070	2 070	2 070	2 070
	%	3.05%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%
ВС Божурище	Вход система (хил. м3)	146	110	149	146	146	146	146
	Фактурирани количества (хил. м3)	146	110	149	146	146	146	146
	Загуби (хил. м3)	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%
ВС София	Вход система (хил. м3)	158 250	151 986	153 661	142 556	138 282	133 980	129 968
	Фактурирани количества (хил. м3)	79 434	78 088	81 478	78 084	78 218	78 172	78 141
	Загуби (хил. м3)	78 816	73 898	72 184	64 472	60 064	55 808	51 828
	%	49.80%	48.62%	46.98%	45.23%	43.44%	41.65%	39.88%
Общо "Софийска вода" АД	**Общо добита вода (хил. м3)**	**167 029**	**160 712**	**163 048**	**152 050**	**147 470**	**143 012**	**138 845**
	Фактурирани количества (хил. м3)	**86 862**	**84 744**	**88 794**	**85 508**	**85 336**	**85 135**	**84 947**
	Загуби (хил. м3)	**80 167**	**75 968**	**74 254**	**66 542**	**62 134**	**57 878**	**53 898**
	%	48.00%	47.27%	45.54%	43.76%	42.13%	40.47%	38.82%

Sofiyska Voda JSC – non-revenue water (Q9)



CONCLUSION

We think that in this rapidly changing and unstable regulatory framework, Sofiyska Voda has prepared a realistic and balanced business plan for the period 2017 – 2021, envisioning an ambitious investment program (BGN 209.16 million) and the achievement

of the levels of key performance indicators for water supply and sewerage services determined by the EWRC.

Sofiyska Voda JSC believes that the open and expert discussion on the key assumptions in the Business Plan with the main stakeholders – the MoS, the EWRC and society is more than necessary in order to have full clarity in terms of the long-term plans of the Company and the possibilities of ensuring a stable financial framework in the new regulatory period, which will secure the implementation of the Business Plan of the Company.

The company remains available for further meetings and clarifications regarding the proposed in the document activities and assumptions.