

## WATER RESCUE

Water resources efficiency and conservative use in drinking water supply systems

**Interreg**  
**Greece-Bulgaria**  
**WATER RESCUE**  
European Regional Development Fund



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<b>WP</b>	<b>6 Policy Recommendation</b>
<b>Deliverable</b>	<b>6.4.1 Joint Water Efficiency Policy Recommendation</b>
<i>Tool</i>	<i>Joint Deliverable</i>
<b>Sub-Deliverables integrated</b>	<b>D.6.1.1, D.6.2.1, D.6.3.1, D.6.4.1, D.6.5.1</b>
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<b>No</b>	
<b>Beneficiary Institution</b>	<b>Municipality of Kardzhali</b>

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## Chapter 1. Introduction: The WATER RESCUE project in brief

WATER RESCUE project's concept is based on the common cross-border (CB) water management problems in the two international river basin districts (RBDs) shared between Greece & Bulgaria (Struma-Strymonas; Maritsa-Evros). The common CB problems include water resources quality & quantity being at risk due to natural and human activities and climate change conditions. The consequence is that water bodies fail to meet the good ecological status (GES) (recorded in the river basin management plans-RBMP). In particular, drinking water faces significant risks due to the deteriorated water resources quality while at the same time significant water volume is lost in the water distribution networks (WDNs). The project aims at the sustainable and efficient management of drinking water supply by increasing drinking water use efficiency in WDNs and improving water quality in the whole water supply cycle (from the source and back to the environment). Good Ecological Status can be achieved by improving water quality and reducing water abstraction and can be maintained by taking climate change adaptation measures. The project focuses in drinking water supply management suffering from high Non-Revenue Water (NRW) levels and deteriorated water quality jeopardizing the drinking water consumers' safety and health and their quality of life. Urban water volumes end up to the sewerage networks while wastewater treatment plants are a pressure to water resources quality. Surface water bodies are both used for drinking water abstraction and are the final recipient of treated effluents. Thus, their ecological status is affected by both water quantities abstracted and water quality in the whole water supply cycle (from the resource to the water supply and the wastewater treatment plant and back to the environment).

### 1.2 Theme of the Project

WATER RESCUE project is expected to achieve Non-Revenue Water/water losses reduction by upgrading and adapting already developed methodologies, technologies and tools including Water Balance assessment and Performance Indicators, hydraulic simulation models, decision support systems and GIS tools. Additionally, WATER RESCUE is expected to achieve water quality improvement across the entire water supply chain (from the water intake point and the raw water treatment plant, back to the environment after the waste water treatment plant) through constant monitoring of water quality parameters in real time, water quality simulation models (including water age) and automatic chlorination systems on line and in line. Climate change impacts will be assessed to finally propose and adopt measures for climate change adaptation. WATER RESCUE has a clear innovative character since the methodologies and tools are integrated and do not tackle individual problems. It is the first time that integrated methodologies will be adapted to include the entire drinking water supply cycle. These methodologies/tools will serve as Early - Warning Systems both for water quantity and quality. WATER RESCUE results will improve drinking water management. At the same time as drinking water is involved, the consumers' safety and health are safeguarded and their quality of life is improved. Non-Revenue Water reduction will increase water resources efficiency, since less water will be abstracted from surface and groundwater bodies and reduce energy consumption as water and energy are interconnected in water supply systems (water-energy nexus). Drinking water quality will be improved through real time monitoring of water quality parameters across the entire water supply chain, from the water intake points, to the water treatment plant and the water distribution network, back to the environment through the wastewater treatment plant. Thus, drinking water quality will be safeguarded from its source up to the consumer's tap. As wastewater effluents return to water resources, their quality monitoring prevents water resources degradation due to this pressure. Water and energy resources efficiency will be promoted and the ability of the cross-border area to adapt to climate change conditions will be improved as all possible natural and man-made pressures will be evaluated, including climate change conditions. Water saving will be accomplished through water losses reduction and increase of the

environmental awareness of the public. The quality of life is expected to be upgraded with special emphasis to the protection of the natural environment. Joint policy recommendation guidelines and papers will be developed. Good governance, transparency and participation of all stakeholders in the design, implementation and monitoring of these policies is expected. Know-how and technology transfer will take place not only among the beneficiaries but also in the stakeholders' network that will be developed.

### 1.3 Project Objectives

The project's main objective is the sustainable cross –border drinking water supply management aiming at water resources efficiency and conservative use through:

1. Adaptation of a joint methodological framework for water resources management (qualitatively and quantitatively) in relation to the climate change and the natural and human activities and reduction of the water resources vulnerability;
2. Increase water use efficiency through the reduction of Non-Revenue Water and water losses in the water supply networks by implementing measures tackling NRW causes;
3. Improve water quality and safety in the whole drinking water supply cycle, from the water resources to the water distribution network and back to the environment through the continuous monitoring of water quality parameters in real time and the in-line disinfection to reduce the risk of low chlorine residuals and excessive concentrations of THMs (toxic substances causing cancer);
4. Increase innovative technologies use through the integrated management of water resources including GIS-based applications; hydraulic simulation models & decision support systems;
5. Development of “green behavior”, increase water saving & reduce water consumption through public awareness campaigns.

WP	Task	Leader	Duration																																												
				Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	July 2018	Aug 2018	Sept 2018	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	June 2021
WP1: Project Management & Coordination	1.1 Preparation activities	LB	10/11/2017-9/11/2020																																												
	1.2 Project Management																																														
	1.3 Self evaluation																																														
	1.4 Steering committee meetings																																														
	1.5 Audit Costs																																														
WP2: Project Communication & Dissemination	2.1 Project Communication Plan	LB	10/11/2017-9/11/2020																																												
	2.2 Project Website																																														
	2.3 Publication & Dissemination Material																																														
	2.4 Awareness events																																														
	2.5 Final events Awareness Events																																														
WP3: Current Status Analysis & Assessment	3.1 Climate change impacts assessment	PB5	10/11/2017-9/11/2020																																												
	3.2 Water Audit																																														
	3.3 Water quality																																														
WP4: Common Methodology & Tools	4.1 Cross border water resources vulnerability assessment	PB3	10/11/2017-9/9/2020																																												
	4.2 Water use efficiency																																														
	4.3 Water quality																																														
WP5: Pilot Actions	5.1 Ex Ante evaluation	PB2	10/11/2017-9/11/2020																																												
	5.2 Pilot actions implementation																																														
	5.3 Workshops & transfer visits																																														
	5.4 Ex Post evaluation																																														
WP6: Policy Recommendation	6.1 Joint water efficiency policy recommendation	PB4	2/5/2019-9/11/2020																																												
	6.2 Joint water quality policy recommendation																																														

Figure 1.1. WATER RESCUE timetable

### 1.4 The Project structure and timetable

The project consists of six work packages:

- WP1: Project Management and Coordination
- WP2: Project Communication and Dissemination
- WP3: Current Status Analysis & Assessment
- WP4: Common Methodology and Tools
- WP5: Pilot Actions
- WP6: Policy Recommendation

The initial total project duration was 24 months but extension was given and the final total duration is 36 months, from 10/11/2017 to 9/11/2020 (Figure 1.1).

## 1.5 Project Beneficiaries

Lead Beneficiary is the Municipal Water and Sewerage Company of Komotini (Greece); Beneficiary 2 is the Municipal Water and Sewerage Company of Thermi (Greece); Beneficiary 3 is the University of Thessaly-Special Account Funds for Research-Department of Civil Engineering (Greece); Beneficiary 4 is the Municipality of Kardzhali (Bulgaria); Beneficiary 5 is the Municipality of Gotse Delchev (Bulgaria); and Beneficiary 6 is the Municipal Water and Sewerage Company of Thermaikos (Greece).

**Table 1.1.** WATER RESCUE beneficiaries

PB #	PP name	City	Country
PB1	Municipal Water Supply and Sewerage Company of Komotini	Komotini	Greece
PB2	Municipal Water Supply and Sewerage Company of Thermi	Thermi	Greece
PB3	University of Thessaly-Special Account Funds for Research-Department of Civil Engineering	Volos	Greece
PB4	Municipality of Kardzhali	Karddzhalı	Bulgaria
PB5	Municipality of Gotse Delchev	Gotse Delchev	Bulgaria
PB6	Municipal Water Supply and Sewerage Company of Thermaikos	Neoi Epivates	Greece

## 1.6 The present deliverable

### 1.6.1 The subject of the present deliverable

The present deliverable refers to the WP6 “Policy recommendation”. WP6 is led by the Municipality of Kardzhali (PB4) and includes the policy recommendation for water use efficiency and for water quality. More specifically the present deliverable 6.1 “Joint water efficiency policy recommendation” where the policies implemented in both countries are presented, the existing gaps are identified, and the lessons learnt from the pilot actions of the beneficiaries are identified. Finally, the beneficiaries suggest policy recommendations for policy makers and stakeholders regarding water use efficiency.

### 1.6.2 The approach applied developing the present deliverable

PB4, Municipality of Kardzhali, with the assistance of PB3, University of Thessaly, took over the responsibility to prepare the joint deliverable of WP6.1. To do so, a questionnaire has been prepared by PB3 to gather the necessary data. The questionnaire consisted of the following chapters: (a) Policy recommendation objective; (b) Key stakeholders’ list; (c) current policy framework or approach; (d) identified gaps in current policy framework or approach; (e) lessons learnt, lesson from practice; (f) recommendations for policy makers; and (g) social, economic, environmental benefits. All beneficiaries provided their deliverables to the WP leader, PB4, who properly elaborated the data in order to prepare the joint deliverable.

## Chapter 2. Overview of the Water Use Efficiency policy in Europe

### 2.1 Water Framework Directive

The Water Framework Directive (WFD 2000/60 / EC) establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. This new framework of European water legislation is the most complete package of objectives, tools and obligations.

The Framework Directive introduces a new principle for environmental management in the field of water - the so-called basin management. In the management of water resources, the river basin is perceived as a separate unit and therefore the institutional structures for water management are built on the territory of areas delineated by the boundaries of the main river basins.

Two of the main objectives of the WFD are:

- protection and improvement of the aquatic environment
- the contribution to sustainable, balanced and appropriate water use.

New instruments for the protection and improvement of all waters have been introduced in European water policy:

- assessment of the ecological status,
- river basin planning,
- strategy for elimination of pollution with dangerous substances,
- informing the public and consulting,
- financial instruments.

The WFD aims to protect the physical and biological integrity of aquasystems, and hence the base of human water sources. Thus, one of the main objectives of the Directive is to protect the environment. The main tools are a comprehensive and environmentally oriented assessment of surface water status and the resulting objectives.

Ecological status is determined by biological, hydromorphological (eg habitat conditions) and physico-chemical quality elements. The norm is the biological parameters of undamaged water. These are waters with minimal consequences of human intervention. This integrated approach, which extends the current targets for water quality to water quantities, habitat quality and biological problems, is to improve the protection of the aquatic environment.

The WFD relies on a comprehensive approach to water conservation and improvement. This requires rehabilitation measures, such as providing ecologically oriented water quantities to support natural biodiversity.

Annex V of the WFD regulates the monitoring of the status of surface and groundwater and protected areas. It obliges the countries that have adopted the directive to develop water monitoring programs in order to have a coherent and comprehensive status review in each basin management area. For surface waters, these programs include:

- the volume and level or flow rate of the flow;
- ecological, chemical status and ecological potential

The cited annex to the WFD regulates the monitoring of waters and the assessment of the information collected through it, in four main sections:

a) Determination of the qualitative elements for classification of the ecological status of surface waters (rivers, lakes, transitional and coastal waters, artificial and heavily modified water bodies). There are three main quality elements for classifying the ecological status of different categories of waters: physico-chemical elements (temperature conditions, oxygen regime, salinity, acidity, nutrients (N, P), specific pollutants). The hydromorphological and physico-chemical quality elements are supportive of the biological ones.

b) Normative definitions of classifications for the ecological status of surface waters. The definitions of "very good", "good", "moderate", "poor" and "very poor" water status are defined for each of the specified quality elements, classifying the status of the different water categories.



c) Monitoring the ecological and chemical condition of surface waters. The goals and tasks of the three main types of monitoring programs are regulated: control, operational and exploratory. The monitoring covers the indicator parameters for each quality element, which means that for each of them, appropriate indicators must be selected to be monitored and compared with the relevant baseline characteristics. Comparing these parameters with the parameters of "very good" status and the international scale for the boundaries between different types of status, each element can be defined as "very good", "good", "moderate", "bad" and "very bad". The general ecological status of a water body is defined as a combination of biological and physico-chemical results.

## 2.2 Green Deal

The European Green Treaty aims to make the EU a just and prosperous society, with a modern, resource-efficient and competitive economy that has zero=no net greenhouse gas emissions in 2050 and where economic growth is disconnected from resource use.

It also aims to protect, preserve and increase the EU's natural capital, as well as to protect the health and well-being of citizens from environmental risks and impacts. At the same time, this transition must be fair and inclusive. It must put people first, and pay attention to the regions, industries and workers who will face the greatest challenges. As it will bring significant change, active public participation and trust in the transition are paramount if policies are to work and be adopted. A new pact is needed to unite citizens in all their diversity, with national, regional, local authorities, civil society and industry working closely with the EU institutions and advisory bodies.

The EU has the collective capacity to transform its economy and society to put it on a more sustainable path. It can build on its strengths as a world leader in climate and environmental measures, consumer protection and workers' rights. Providing additional emission reductions is a challenge. It will require massive public investment and increased efforts to channel private capital into climate and environmental action, while avoiding confinement in unsustainable practices. The EU must be at the forefront of coordinating international efforts to build a coherent financial system that supports sustainable solutions. This pre-investment is also an opportunity to put Europe firmly on a new path of sustainable and inclusive growth. The European Green Treaty will also accelerate the transition needed in all sectors.

To ensure the European Green Treaty, it is necessary to rethink policies for the supply of clean energy throughout the economy, industry, production and consumption, large-scale infrastructure, transport, food and agriculture, construction, taxation and social benefits. To achieve these goals, it is essential to increase the value given to the protection and restoration of natural ecosystems, the sustainable use of resources and the improvement of human health. This is where transformational change is most needed and potentially most beneficial to the EU's economy, society and natural environment. The EU should also encourage and invest in the necessary digital transformation and tools, as these are significant opportunities for change.

Although all these areas of action are highly interconnected and mutually reinforcing, careful attention will need to be paid when there are potential trade-offs between economic, environmental and social objectives. The Green Treaty will consistently use all policy levers: regulation and standardization, investment and innovation, national reforms, dialogue with the social partners and international cooperation. The European Pillar of Social Rights will guide action to ensure that no one is left behind.

The new measures alone will not be enough to achieve the objectives of the European Green Treaty. In addition to launching new initiatives, the Commission will work with Member States to step up EU efforts to ensure that existing legislation and policies relevant to the Green Deal are implemented and enforced effectively.

## Chapter 3. Current policy framework in Water use efficiency in Bulgaria and Greece

### 3.1 Bulgaria

The state policy on water management aims to achieve and maintain good status of all groundwater, surface and sea water, as a resource of special importance for life on the planet, as well as limiting the harmful effects on human life and health, environment, cultural heritage and economic activity.

At the national level, the water management policy is implemented by the Ministry of Environment and Waters, assisted by the Water Management Directorate, and at the basin level - by 4 Basin Directorates, with 15 Regional Inspectorates of Environment and Water monitoring and control of wastewater in the boundaries of their respective territorial scope. The water management policy is aimed at the development and implementation of River Basin Management Plans as a basic planning document for integrated water management and the Marine Strategy by:

providing sufficient quantity and quality of water for the needs of the population, the economy and ecosystems - continuity of water supply and reduction of the quantities of seized and used water for efficiency of water consumption and management as an economic resource;

control of wastewater discharges and development of the monitoring system;

reduction of adverse climate impacts - assessment of the threat and risk of floods, identification of areas with significant potential risk of floods, development and implementation of Flood Risk Management Plans, taking specific preventive and protective measures and measures for preparedness of the competent authorities and the population;

financing of sustainable investments in ecological water supply and sewerage infrastructure.

Water management is carried out in accordance with the legislation of the European Community and national legislation - Law on Environmental Protection, Law on Water, Regulations, National Strategic and Planning Documents - National Strategy for Management and Development of the Water Sector, River Management Plans basins, Flood risk management plans, Marine strategy, national programs in the field of water protection and sustainable development.

Bulgaria is a party to several international conventions in the field of water, including the Convention on Cooperation in the Protection and Sustainable Use of the Danube River, the Convention on the Protection of the Black Sea against Pollution and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

### 3.2 Greece

Greece implements the Water Framework Directive 2000/60 / EC as an EU Member State. The Law on the Transposition of the WFD into National Law is Law 3199/2003 (Official Journal 280A / 9.12.2003) on "Water Protection and Management" in accordance with the Water Framework Directive 2000/60 / EC and Presidential Decree 51/2007. Establishment of measures and procedures for integrated water protection and management in accordance with the provisions of Directive 2000/60 / EC "Establishing a framework for Community action in the field of water policy".

There is no specific legislation on water efficiency in Greece, with the exception of the measures provided for in the RBMP on leakage reduction.

### 3.3 Key stakeholders' list

#### IN GREECE

The main stakeholders in the supply and management of drinking water in Greece are the Ministry of Environment and Energy through its General Secretariat for Environment and Water and the Ministry of Health (in terms of water quality).

At the regional level, the water directorates of the decentralized regional authorities implement the national policy at the regional level. The two largest water supply companies (EYDAP SA, serving the greater Athens



area and EYATH SA, serving the city of Thessaloniki), all municipal water supply and sewerage companies and the municipal water supply and sewerage departments of the smaller municipalities are responsible for providing drinking water. water water services for the population. The Greek Association of Municipal Water Supply and Sewerage Enterprises (EDEYA) and the Greek Water Association are recognized as national organizations. At European level, stakeholders that have been recognized include the European Parliament, the European Association of National Water Supply Associations (EurEau), Water Europe, DG Environment, the International Water Association (IWA) and the European Environment Bureau (EEB).

## IN BULGARIA

The main responsibilities for water management and water supply and sewerage in Bulgaria are divided between the following institutions:

The Ministry of Regional Development and Public Works is responsible for the overall policy related to the design, construction and operation of water supply and sewerage systems in the country. The Minister represents the state in the water supply and sewerage companies with over 50% state share. The Ministry also coordinates the activities of water associations and provides methodological guidance on the preparation of master plans for water supply and sewerage.

The Ministry of Environment and Water (MoEW) is responsible for the management and allocation of water resources at the national level. The Minister issues permits for water abstraction of mineral water - exclusive state property. The MoEW is also responsible for the protection of the environment and the implementation of the Operational Program Environment, which finances the water supply and sewerage infrastructure. The Council of Ministers defines the state policy in water supply and sewerage as part of the water policy of the country and the National Strategy for Development and Management of the Water Sector in Bulgaria. The Council of Ministers adopts a Strategy for development and management of the water supply and sewerage sector in Bulgaria for a period of at least 10 years. The strategy defines the main goals, priorities, stages and the necessary resources and sources of financing for the construction

and development of water supply and sewerage systems and to improve the quality of water supply and sewerage services. The policy in the water sector is implemented by: 1. The Minister of Regional Development and Public Works, 2. Municipal councils and mayors of municipalities.

The Ministry of Health is responsible for the control of the quality of water intended for drinking and domestic use, the quality of mineral water intended for drinking or used for prophylactic, therapeutic and hygienic purposes, including bottled mineral water in the commercial network and the quality of water intended for bathing.

The basin directorates perform water management at the basin level. There are four basin directorates: (i) Danube-Pleven Basin Directorate, (ii) Black Sea Basin Directorate - Varna, (iii) West Aegean-Blagoevgrad Basin Directorate and (iv) Eastern Basin Directorate Aegean Sea Basin Directorate - Plovdiv.

The directorates develop river basin management plans and flood risk management plans. They are also responsible for issuing permits for use and water abstraction, for monitoring compliance with the parameters set out in these permits, for controlling activities in riverbeds and for monitoring the quantity and quality of water. Their water management is based on basin principles.

Water associations are non-profit legal entities. They manage water supply and sewerage systems within a certain territory in cases where the ownership of water supply and sewerage is distributed between the state and one or more municipalities or between several municipalities. If the water supply and sewerage system, which falls within the specified territory, is owned by one municipality, the management is carried out by the municipal council.

The governing bodies of a water association include a General Assembly, which consists of representatives of the state (regional governor) and the municipality (s), with the chairman being the regional governor. In cases where the state and more than one municipality participate in the Water Association, the state is entitled to 35 percent of the votes, and the remaining 65 percent of the votes are distributed among all municipalities in proportion to their population. The necessary funds for the activity of the water associations are provided by the state and the municipalities according to the ratio of their votes.

With regard to the Water Act, water associations are responsible for the preparation of regional master plans and investment programs attached to the plans.

The assignment and approval of these specific Master Plan is done by the Ministry of Regional Development and Public Works. The regional master plans are adopted and approved by the Ministry of Regional Development and Public Works only after they are approved by the respective Water and Sewerage Association or the Municipal Council.

The Water Supply and Sewerage Companies (HCS) (called Water Supply and Sewerage, SCC, VKTV or INFRASTROY in the Central Region) are responsible for the operation, management and maintenance of water supply and sewerage facilities in the settlements, as well as the provision of water supply and sewerage services to consumers. Water supply and sewerage is a commercial, state or municipal company - a legal entity that has concluded a contract with the chairman of the respective water supply and sewerage association or with the mayor of the respective municipality. The term of the contract with Water and Sewerage, concluded in accordance with the Water Act, may not be longer than 10 years, provided that it does not include an obligation for Water and Sewerage to build a new water and sewerage infrastructure; or 15 years if it obliges the WSSC to undertake the construction of new infrastructure. In all other cases, the procedure and the selection of a water supply and sewerage operator, as well as the signing of the contract are carried out in accordance with the Concessions Act.

The municipalities are direct beneficiaries under OP "Environment". The mayor of a municipality develops and implements the policies related to planning, management, construction, reconstruction and modernization of water supply and sewerage networks and facilities, which are municipal property.

The municipal councils control the municipal participation in water supply and sewerage companies (in those companies in which the municipalities have shares). They also endorse municipal development plans and mayoral statements on business plans developed by the WSSC.

The State Commission for Energy and Water Regulation (SEWRC) is responsible for regulating the tariffs, availability and quality of water supply and sewerage services under the Water Supply and Sewerage Services Regulation Act.

The Executive Environment Agency under the Minister of Environment and Water manages the National Environmental Monitoring System. The main responsible water management institutions in Greece and Bulgaria, as EU Member States, overlap, as required by the Water Framework Directive (WFD 2000/60 / EC).

### 3.4 Identified gaps in existing policy framework

The system of normative acts, forming the legal framework of the water sector, does not allow completely independent sectoral development of the legislation and so far has not developed systematically. Rather, certain areas under the influence of specific internal or external factors have had a leading development, while others have lagged behind and are currently having a destructive and restraining effect on the entire system of public relations. Although in the role of a general normative act for the system, the Water Act is not entirely such for a large part of the provisions of the accompanying laws and does not fully subordinate them to its structure and system. On the other hand, the Law does not fully regulate all legal relations in the water sector and does not provide a complete and unified common system and principles for the development of the legal framework. There are several leading legal principles within the water sector. The system so far lags behind the needs of society and the economy from the respective development of the water sector, both in the field of integrated water management and water management systems and facilities, and in individual industries and directions - e.g. hydromelioration, water purification in the field of water supply and sewerage services, protection from the harmful effects of water and floods and others. The generalized conclusions in specific directions on the identified problems in the structure and development of the legal framework and the conclusions of the analysis are as follows:

- Lack of a national policy on water efficiency - The Water Act says that water use must be efficient, but there are no specific parameters for this efficiency. The regional basin directorates are responsible for controlling the amount of water used by a water source according to a water user permit and the quality and quantity of water discharged back according to the water discharge permit. They are not responsible for access if the amount of water used is relevant to the population or industry being served and do not implement any strategies to reduce water use, protect water or increase water efficiency. The water regulator imposes and controls the application of some indicators related to water efficiency, but this is related to business planning rather than the approach to clear water efficiency.
- Lack of a differentiated approach - the only indicators that have something to do with water efficiency are too common and do not take into account regional and local circumstances. In addition to the need for a national water efficiency strategy, the current available indicators need to be improved and all the specificities of the area where they are applied must be taken into account.

Several gaps related to water efficiency have been identified, such as:

- There is no specific legal document for water efficiency
- No water efficiency targets have been set at national or regional level
- The complete procedure for calculating water costs is not directly related to water efficiency
- Funding programs are not directly related to water efficiency.

The identified gaps in the current water efficiency policy in Greece are the following:

- Lack of a specific national or regional policy for water efficiency;
- Lack of water efficiency targets, such as NRW or water loss levels;
- Although the measures included in the Programs of Measures of the River Basin Management Plans include the reduction of water losses, no specific activities related to water efficiency have been described;
- Lack of national or regional data on water efficiency except for research.

### 3.5 Lessons learnt from practice

From the implementation of the WATER SAVING project and the implemented pilot actions, lessons have been learned related to the efficiency of water use.

The project action of delivery and installation of flow meters made possible to locate sections of the water supply system where there is a suspicion of water loss or theft. Also after their installation it will be possible to identify possible accidents in these sections very accurately and quickly.

The results of the implementation of the pilot actions showed that there is a serious underestimation of the water volume, which leads to a false assessment of non-revenue water. Thus, the water supply cannot identify the actual value of the NRW and the reasons for this in order to develop strategies and take measures to reduce them.

On the basis of the performed real measurements the project beneficiaries managed to estimate the real water losses and to consider separately a certain part of the city water supply network and to prove the need for rehabilitation there.

Targeted actions in the most critical part of the network gave significant results in the conditions of impossibility to replace the whole network of one city.

The implementation of the pilot action showed that the water supply and sewerage has a very good knowledge of the spatial and temporal distribution of accidents, which allows to design the next steps regarding the repair of network assets or even their replacement when necessary. Also, the repair time is reduced, as the water supply and sewerage system is immediately informed of any damage to the water distribution network. Consumers are notified of specific water problems or outages, improving their relationship with the water company.

A methodology for increasing water efficiency has also been developed. The first step towards this goal is to develop a water balance and identify the causes of NRW. Then, based on the reasons for NRW, several measures are presented. Water operators can choose from measures based on criteria they set, such as economic, cost-benefit, criteria related to the effectiveness of the measure or consumer concerns, and more. The beneficiaries implemented several measures to reduce NRW and increase water efficiency. Such measures include the speed and quality of repair and replacement of water mains aimed at real losses, reliable assessment of incoming water and more.

## Chapter 4. Recommendations, Challenges and Benefits

### 4.1 Recommendations

Recommendations for policy makers on water efficiency should include preparation of Best Practice Operational Techniques documents BREFs for water management and reducing NRW and the establishment of an action plan to identify the problem and take the necessary measures.

Water supply companies should communicate their findings and lessons learned from their pilot actions to other companies with similar characteristics or problems, which in turn should develop ex-ante and ex-post studies.

National authorities, using the results of regional surveys, may carry out national surveys, setting related targets.

At European level, the EUREAU can provide guidance to national organizations and seek funding for such measures for water companies.

The proposed measures to increase the efficiency of water use are the following:

- providing socio-technical solutions for water management for water supply companies; providing improved knowledge of water use and sustainability constraints and improved monitoring of water resources and uses on a transboundary scale;
- planning of educational and training programs for the public;
- consideration and use of economic instruments for water resources management (eg water abstraction fees);
- creation of a national educational program for water supply for the purpose of training in water audit;
- setting national targets and bonuses for water companies that capture the targets (eg getting priority in funding programs, etc.).
- Providing know-how and funds for efficient use of water to water supply and sewerage companies;
- Promoting measures aimed at reducing the NRW for water supply companies (operational and financial);
- Establishing national or regional targets for NRW;
- Promoting measures to report data on NRW and water losses at regional and national level;
- Providing financial instruments to Water and Sewerage in order to use new technological solutions;
- Promoting measures to inform the public.

The water sector also needs a long-term water efficiency strategy that takes into account all local and regional specifics. At European level, it is mandatory for the European Commission to introduce different KPIs to assess the real results of the money invested in water infrastructure in different countries. Stakeholders need to be more active in monitoring the level of water use efficiency and require certain actions to be taken to improve this process.

### 4.2 Challenges

The main challenge of WATER RESCUE is the efficient use of water resources by reducing water losses in water supply networks and water saving activities.

The second challenge is to improving water quality along the entire water supply chain (from the point of water intake and the raw water treatment plant, back to the environment after the wastewater treatment plant). By implementing a system of constant monitoring of the water quality parameters in real time, a registration of the needed improvements will be established. By the implementation of the needed measures at economical affordable price for the public is a the third challenge.

Achieving a public with increased awareness of water issues and establishing a stakeholder network is also a significant one.

The last but not at least is assuring the needed resources and implementation tools for reducing the vulnerability of water resources (both quality and quantity) due to climate change.

### 4.3 Social, Economic, Environmental Benefits

Good quality water is a valuable and limited resource of paramount importance for human health, economic prosperity and social well-being. This is the main challenge - the establishment of such management in the water sector, through which to meet the needs of water in the required quantity and quality, both to ensure the life and health of the population and the needs of the economy, in ensuring conditions for the reproduction and development of aquatic ecosystems.

Increasing the efficiency of water use has direct economic and environmental positive effects. Reducing water losses, water as a natural resource is protected and the pressure on water resources is reduced. Reduced NRW levels provide economic benefits to the water utility as less water volume is extracted, treated and distributed. Also, reducing visible losses means direct economic benefits, as larger water volumes are registered and water theft is reduced. When the NRW level decreases, then the total price of water decreases, which means that the price of water is lower. This is a social benefit as consumers pay less for the same amount of water consumed.

The adoption of a strategy for improving the efficiency of water use will focus on investments in strategic measures and sites and this will protect local municipalities and the government from urgent investments in case of water shortages in the future. The national strategy for water efficiency must cover not only water use but also the quality of discharged water. Efficiency in the wastewater discharge process is crucial for the environment. In addition, improved water efficiency will reduce the amount of water extracted from the environment for water supply and industrial purposes.



## Chapter 5. Summary, final comments & conclusions

In conclusion, we can indicate the measurable results and related results of the WATER RESCUE project as follows:

- Climatic assessment of the impact on the state of water supply and drinking water;
- Water audit report assessing the current state of drinking water systems in relation to the NRW;
- Water quality report assessing current and future pressures on drinking water collection points;
- Common methodologies for assessing the vulnerability of transboundary water resources, identifying risks and hazards and protecting water areas by developing measures to protect transboundary water resources;
- Common methodologies and tools for the effectiveness of the use of drinking water, providing specific measures and tools leading to an early warning system
- Common methodologies and tools for ensuring water quality along the entire water supply chain (from water resources and back to the environment).

## References

## Appendix A: Beneficiaries' reports

## WATER RESCUE

Water resources efficiency and conservative use in drinking water supply systems

**Interreg**  
**Greece-Bulgaria**  
**WATER RESCUE**



European Regional Development Fund

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**WP**                      **6 Policy Recommendation**

**Deliverable**                      **6.1.1 Joint Water Efficiency Policy Recommendation**  
*Tool*                                      *Questionnaire*

**Project Beneficiary**    **PB1**  
**No**

**Beneficiary Institution**                      **Municipal Water Supply and Sewerage Company of Komotini**

The Project is co-funded by the European Regional Development Fund (ERDF) and by national funds of the countries participating in the Cooperation Programme Interreg V-A "Greece-Bulgaria 2014-2020".

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**Name of the organization/institution: Municipal Water Supply and Sewerage Company of Komotini**

**Beneficiary number: PB1**

## 1 Policy Recommendation Objective

For the Municipal Water Supply and Sewerage Company of Komotini (DEYA Komotini) the objective of the policy recommendation is the need for the introduction of an institutional framework related to water used efficiency in water utilities and a change to a new strategy. The reason for that is because there is no legislative or institutional framework in Greece regarding water use efficiency in water utilities, except of the efforts done by the Hellenic Association of the Municipal Water Supply and Sewerage Companies (EDEYA) trying to educate water operators to water auditing.

## 2 Key Stakeholders List

The stakeholders related to water use efficiency are the following:

- At National level: the General Secretariat for Natural Environment and Water in the Ministry of Environment and Energy and EDEYA
- At regional level: the Water Directorate of the Decentralized Regional Authority of Eastern Macedonia and Thrace
- At local level: the water utilities in the Regional Unit of Rodopi.

Below we present a list of the key stakeholders in the area of Rodopi and their email addresses:

**Table 1.** Key stakeholders

	<b>Stakeholder's organization</b>	<b>Email address</b>
Local Level	lasmos municipality	politis@iasmos.gr
	Arriana municipality, Department of Water Supply	filyra@0924.syzefxis.gov.gr
	Marronia – Sappes Municipality, Department of Technical Services, Environment and Civil Protection	dimostopo@gmail.com
Regional Level	Water Directorate, Decentralized Regional Authority of Eastern Macedonia & Thrace	dy-amt@damt.gov.gr
	Directorate of Environment and Spatial Planning, Regional Authority of Eastern Macedonia & Thrace	dphs@pamth.gov.gr
National Level	Hellenic Association of the Municipal Water Supply and Sewerage Companies (EDEYA)	info@edeya.gr
	General Secretariat for Natural Environment and Water, Ministry of Environment and Energy	grggper@ypen.gr

## 3 Current Policy Framework or approach

There is no specific legislative or institutional framework related to water use efficiency in Greece. Water use efficiency is managed under the general framework set by the WFD 2000/60/EC and thus in Greece the legislative documents for the implementation of the WFD are:

- Law 3199/2003 (Official Gazette 280A/9.12.2003) for the "Protection and Management of Water" in compliance with the Water Framework Directive 2000/60/EC;
- Presidential Decree 51/2007 "Establishing measures and procedures for the integrated protection and management of water in accordance with the provisions of Directive 2000/60 / EC "establishing a framework for Community action in the field of water policy" of the European Parliament and of the Council of 23 October 2000
- 1<sup>st</sup> revision of the River Basin Management Plan (RBMP) of the Water District of Eastern Macedonia and Thrace.

Under the Programme of measures of the RBMP of Eastern Macedonia and Thrace, the provision of measures to reduce water losses in water distribution networks are foreseen. Also, the water utilities should implement their Masterplans, being strategic plans to ensure adequate water for the water utilities and to plan any new water works.

#### 4 Identified gaps in current policy framework or approach

Several gaps related to water use efficiency are identified, such as:

- There is no specific legal document for water use efficiency
- No targets are set for water use efficiency at national or regional level
- Full water costing procedure is not directly related to water use efficiency
- Funding programmes are not directly related to water use efficiency.

#### 5 Lessons learnt, lessons from practice

DEYA Komotinis implemented a pilot action at the framework of WATER RESCUE project in order to improve speed and quality of repairs in the water distribution network and thus reduce real water losses in the distribution network. The implementation of the pilot action showed that the water utility managed to have a very good knowledge of the spatial and time distribution of failures, allowing for the design of next steps regarding the repair of the network's assets or even their replacement, when necessary. Also, the time to repair is reduced, as the water utility gets informed of any failure in the water distribution network right away. The consumers get notified for any specific problems or water interruptions, improving their relation to the water supply company.

#### 6 Recommendations for policy makers

Policy recommendations for stakeholders, policy makers and water utilities include:

- Water utilities perform water auditing in order to identify their major problems related to water losses and design targeted strategies and measures;
- Provision of improved knowledge of water use and sustainability limits, and improved monitoring of water resources and uses at cross-border scale;
- deliver socio-technical water management solutions for the water utilities;
- plan educational and training programs for the public;
- consider and use economic instruments for water resources management (e.g. water abstraction charges);
- establish a national educational programme for water utilities in order to get training on water auditing;



- establish national targets and bonuses for water utilities that catch the targets (e.g. get priority in funding programmes, etc.).

## 7 Social, Economic, Environmental Benefits

The benefits are environmental ones as water, a valuable natural resource, is protected. Reducing water losses, less water volume is taken from the water resources. There are economic benefits for the water utility as the water volume taken from the water resources is less and the funds necessary for its treatment and distribution are reduced. This allows the water utility to reduce the water price for the consumers and thus there are economic and social benefits for the public.

## 8 Comments

No comments.

## Appendix A:

## WATER RESCUE

Water resources efficiency and conservative use in drinking water supply systems

**Interreg**  
**Greece-Bulgaria**  
**WATER RESCUE**  
European Regional Development Fund



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**WP**                      **6 Policy Recommendation**

**Deliverable**                      **6.2.1 Joint Water Efficiency Policy Recommendation**  
*Tool*                                      *Questionnaire*

**Project Beneficiary**   **PB2**  
**No**

**Beneficiary Institution**                      **Municipal Water Supply and Sewerage Company of Thermi**

The Project is co-funded by the European Regional Development Fund (ERDF) and by national funds of the countries participating in the Cooperation Programme Interreg V-A "Greece-Bulgaria 2014-2020".

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**Name of the organization/institution: Municipal Water Supply and Sewerage Company of Thermi**

**Beneficiary number: PB2**

## 1 Policy Recommendation Objective

The Municipal Water Supply and Sewerage Company of Thermi provides water supply, sewerage and wastewater treatment services to the inhabitants of Thermi Municipality. The objective of the policy recommendation is the suggestion of a new institutional framework regarding water use efficiency in water utilities in Greece. Although measures for the reduction of leakages in water distribution networks are foreseen in the programmes of measures in the River Basin Management Plans, a national framework is lacking.

## 2 Key Stakeholders List

National stakeholders related to water use efficiency are the Greek Ministry of Environment and Energy and especially its General Secretariat for Natural Environment and Water and the Hellenic Association of Municipal Water Supply and Sewerage Companies. Also at national level, the water utilities of the two major cities, Athens and Thessaloniki can be included: EYDAP S.A. and EYATH S.A.

The Water Directorate of the Decentralized Regional Authority of Macedonia and Thrace is the competent authority regarding water issues. Also, the Water Department of the Region of Central Macedonia is a regional stakeholder.

At local level, the board of directors of DEYA Thermi, customers, water users, associations of consumers, etc. are stakeholders. All water utilities in the Regional District of Thessaloniki are considered as local stakeholders.

Below there is the list with their email addresses:

**Table 1.** Key stakeholders for water use efficiency

	<b>Stakeholder's organization</b>	<b>Email address</b>
Local Level	EYATH S.A.	info@eyath.gr
	Municipal Water Supply and Sewerage Company of Lagkadas	info@deyalagada.gr
	Municipal Water Supply and Sewerage Company of Pilaia - Hortiati	info@deyaph.gr
	Municipal Water Supply and Sewerage Company of Volvi	info@deyavolvis.gr
	Municipal Water Supply and Sewerage Company of Delta	info@deyadelta.gr
	Municipal Water Supply and Sewerage Company of Thermaikos	logistirio1@deyath.gr
	Municipal Water Supply and Sewerage Company of Chalkidona	halkidona@deyaha.gr
	Municipal Water Supply and Sewerage Company of Oreokastro	deyaoraiokastrou@gmail.com
Regional Level	Water Directorate, Decentralized Regional Authority of Macedonia & Thrace	dy-km@damt.gov.gr

	Department of Environment and Water, Directorate of Development and Environment, Regional Authority of Central Macedonia	danapt@pkm.gov.gr
National Level	Hellenic Association of the Municipal Water Supply and Sewerage Companies (EDEYA)	info@edeysa.gr
	Ministry of Environment and Energy, General Secretariat for Natural Environment and Water	grggper@ypen.gr

### 3 Current Policy Framework or approach

Greece implements the Water Framework Directive 2000/60/EC as an EU Member State. The law transposing the WFD to the national legislation is Law 3199/2003 (Official Gazette 280A/9.12.2003) for the "Protection and Management of Water" in compliance with the Water Framework Directive 2000/60/EC and the Presidential Decree 51/2007 "Establishing measures and procedures for the integrated protection and management of water in accordance with the provisions of Directive 2000/60 / EC "establishing a framework for Community action in the field of water policy".

There is no specific legislation for water use efficiency in Greece, except of the measures foreseen in the RBMPs regarding leakage reduction.

### 4 Identified gaps in current policy framework or approach

The gaps related to water use efficiency which are identified include the lack of a specific legislative and institutional framework for water use efficiency. There are no targets set at national or regional level for water losses in water distribution networks, as in other countries e.g. France. There is not a national framework for water auditing in Greece.

### 5 Lessons learnt, lessons from practice

The pilot action of DEYA Thermi related to water use efficiency is the supply and installation of flow meters in boreholes used for water abstraction. The water utility did not apply a mechanism to measure the water volume abstracted and this resulted to estimations. Thus, the water utility did not have the opportunity to estimate Non-Revenue Water (NRW) in a reliable way. The results from the pilot action implementation showed that there was a serious underestimation of the water volume abstracted resulting to the false estimation of Non-Revenue Water. Thus, the water utility could not identify the actual value of NRW and its causes in order to design strategies and take measures to reduce them.

### 6 Recommendations for policy makers

DEYA Thermi suggests the following policy recommendations for stakeholders, policy makers and water utilities:

- Provide the know-how and the funds for water use efficiency to the water utilities;
- Promote measures targeting NRW reduction for water utilities (both operational and financial);
- Establish national or regional NRW targets;
- Promote measures to report NRW and water losses data at regional and national level;
- Provide financial tools to water utilities in order to use new technological solutions;
- Promote measures to inform the public.



## 7 Social, Economic, Environmental Benefits

NRW and water losses reduction have direct environmental benefits as they protect water which is a valuable natural resource. As less water volume is needed, the expenditures for water abstraction, treatment and distribution will be reduced and thus, the utility will have reduced expenditures. This will eventually result in the reduced water price for the consumers.

## 8 Comments

No comments.

## Appendix A:

## WATER RESCUE

Water resources efficiency and conservative use in drinking water supply systems

**Interreg**  
**Greece-Bulgaria**  
**WATER RESCUE**  
European Regional Development Fund



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**WP**                      **6 Policy Recommendation**

**Deliverable**                      **6.3.1 Joint Water Efficiency Policy Recommendation**  
*Tool*                                      *Questionnaire*

**Project Beneficiary**    **PB3**  
**No**

**Beneficiary Institution**                      **University of Thessaly-Special Account Funds for Research-Department of Civil Engineering**

The Project is co-funded by the European Regional Development Fund (ERDF) and by national funds of the countries participating in the Cooperation Programme Interreg V-A "Greece-Bulgaria 2014-2020".

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**Name of the organization/institution: University of Thessaly-Special Account Funds for Research-Department of Civil Engineering**

**Beneficiary number: PB3**

## 1 Policy Recommendation Objective

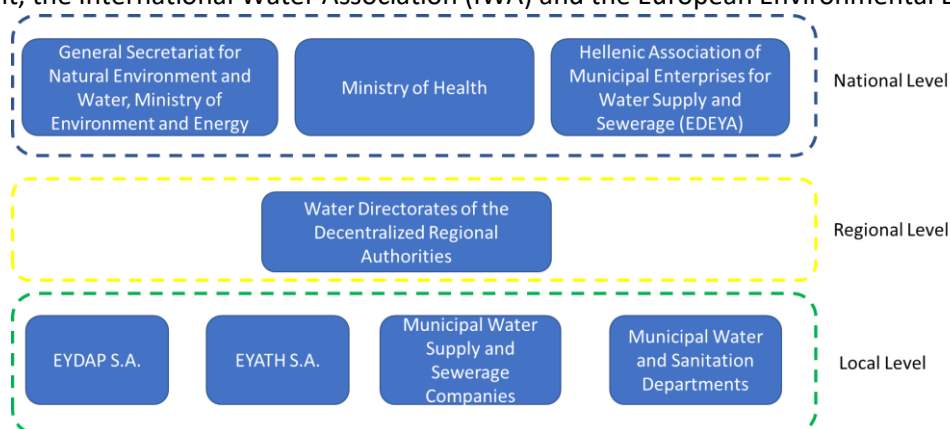
University of Thessaly is Higher Education institution aiming to promote scientific knowledge through teaching and research, and to contribute to the cultural and economic development of the local community, and the society. It promotes scientific and academic excellence in all fields of expertise and rewards outstanding individual performances, establishing new scientific research units and fostering an environment that supports innovative actions.

Civil Engineering department aims at providing high quality education in the Science of Civil Engineering and form the students with the necessary skills for their future professional activities. At the same time the department performs basic and applied cutting-edge research in the science of Civil Engineering. The research team headed by Professor Vasilis Kanakoudis, performs research activities in the area of water supply systems management, management of water resources, etc.

The objective of this policy recommendation for the University of Thessaly is the suggestion of an action plan for the increase of drinking water use efficiency.

## 2 Key Stakeholders List

The key stakeholders for drinking water supply and management in Greece is the Ministry of Environment and Energy through its General Secretariat for natural environment and Water and the Ministry of Health (regarding water quality). At regional level, the Water Directorates of the Decentralized Regional Authorities apply the national policy at regional level. The two biggest water utilities (EYDAP S.A. serving the greater Athens area and EYATH S.A. serving the city of Thessaloniki), all the Municipal Enterprises of Water Supply and Sewerage and the Municipal Water and Sanitation Departments of the smaller municipalities are responsible for the provision of drinking water services to the public. The Hellenic Association of Municipal Enterprises for Water Supply and Sewerage (EDEYA) and the Hellenic Water Association are recognized as national organizations. At European level, the stakeholders that have been recognized include the European Parliament, the European Association of National Associations of Water Utilities (EurEau), Water Europe, DG Environment, the International Water Association (IWA) and the European Environmental Bureau (EEB).



**Figure 1.** Stakeholders for drinking water at national, regional and local level





**Table 1.** Stakeholders at national, regional and local level and their e-mail addresses

Regional / National / European	Stakeholder's organization	E-mail
<b>National</b>	Ministry of Environment and Energy	secmin@ypen.gr
	General Secretariat for Natural Environment and Water / Ministry of Environment & Energy	grggper@ypen.gr
	Ministry of Development and Investments	public@mnec.gr
	Ministry of Infrastructure and Transportation	yme@yme.gov.gr
	Ministry of Rural Development and Food	info@minagric.gr
	Ministry of Health	minister@moh.gov.gr
	Ministry of Interior	info@ypes.gr, ypourgios@ypes.gov.gr
	Ministry of Finance	ministeroffice@minfin.gr
	Ministry of Digital Governance	info@minagric.gr
	Hellenic Association of Municipal Enterprises for Water Supply and Sewerage (EDEYA)	info@edeysa.gr
	EYATH S.A.	Info@Eyath.gr,
	EYDAP S.A.	pubrel@eydap.gr
	Mediterranean SOS Network	info@medsos.gr
	Hellenic Water Association (HWA)	hwaey@gmail.com
	Hellenic Hydrotechnical Association NGO ( <a href="http://eye.web.auth.gr/">http://eye.web.auth.gr/</a> )	
Greek Committee for Water Resources Management NGO ( <a href="http://www.waterinfo.gr/eedyp/whatis.html">http://www.waterinfo.gr/eedyp/whatis.html</a> )		
<b>Regional</b>	Region of Thessaly	periferiarxis@thessaly.gov.gr
	Water Directorate, Decentralized Region of Thessaly	dydatonthes@apdthest.gov.gr
	Municipal Water Supply and Sewerage Company of Larissa	info@deyal.gr
	Municipal Water Supply and Sewerage Company of Trikala	info@deyat.gr
	Municipal Water Supply and Sewerage Company of Karditsa	deyak3@otenet.gr
	Municipal Water Supply and Sewerage Company of Volos	info@deyamv.gr
	Municipal Water Supply and Sewerage Company of Agia	info@deya-agias.gr
	Municipal Water Supply and Sewerage Company of Almiros	deyaalm1@otenet.gr
	Municipal Water Supply and Sewerage Company of Elassona	info@deyael.gr
	Municipal Water Supply and Sewerage Company of Kalampaka	deya_kal@otenet.gr
	Municipal Water Supply and Sewerage Company of Kileler	deyakileler@hotmail.gr
	Municipal Water Supply and Sewerage Company of Mouzaki	deyamouzakiou@mouzaki.gr
	Municipal Water Supply and Sewerage Company of Palamas	deyapal1@otenet.gr

	Municipal Water Supply and Sewerage Company of Pili	deya-p@otenet.gr
	Municipal Water Supply and Sewerage Company of Riga Fereos	deyaf@hol.gr
	Municipal Water Supply and Sewerage Company of Skiathos	deyask@otenet.gr, deyaskiathos@deyaskiathos.gr
	Municipal Water Supply and Sewerage Company of Skopelos	deyaskop@otenet.gr
	Municipal Water Supply and Sewerage Company of Sofades	deyasof@otenet.gr
	Municipal Water Supply and Sewerage Company of Tempi	deya@dimostempon.gr
	Municipal Water Supply and Sewerage Company of Tirnavos	tydeyat@gmail.com
	Municipal Water Supply and Sewerage Company of Farkadona	deyafar@otenet.gr
	Municipal Water Supply and Sewerage Company of Farsala	deyafars@gmail.com
	Regional Unit of Larissa	antiper.lar@thessaly.gov.gr
	Regional Unit of Karditsa	antiper.kard@thessaly.gov.gr
	Regional Unit of Magnesia	antiper.magn@thessaly.gov.gr
	Regional Unit of Trikala	antiper.trik@thessaly.gov.gr
<b>European</b>	EUREAU (European Association of National Associations of Water Utilities)	info@eureau.org
	Water Europe	info@watereurope.eu
	European Environmental Bureau (EEB)	eeb@eeb.org
	DG Environment	
	European Parliament	

### 3 Current Policy Framework or approach

Greece, as an EU Member State, implements Water Framework Directive (WFD 2000/60/EC) and its provisions for the protection of water resources and sustainable water use. At operational level, the River Basin Management Plans (RBMPs) and the Programmes of Measures (PoMs) are the tools for the implementation of the EU legislation. Article 9 of the WFD states that all EU member states should recover the water services' costs including direct, environmental and resource cost. It also requires that adequate incentives are given to water users for the efficient water use. To fulfil this obligation the JMD 135275/22-5-2017 on water costing and pricing was established in Greece. Along with this JMD, the former Special Secretariat for Water (now General Secretariat for Natural Environment and Water) of the Ministry of Environment and Water, has established a monitoring mechanism for the regular collection of information relating to the overall performance of the water services providers (<http://wsm.ypeka.gr/login.html>) where all water utilities have to report specific indicators (apart from cost and cost recovery indicators). The key performance indicators requested from the General Secretariat regarding the operational efficiency of the water services providers are the following:

-  Total length of network
-  Density of water supply network: water meters per km
-  Density of sewerage network: connections per km
-  Coverage of water and sewerage network

- ✚ Authorized water consumption
- ✚ Yearly failures of water and sewerage network
- ✚ Total losses
- ✚ Percentage of total losses
- ✚ Infrastructure Leakage Index (applied only to the two large Water Providers EYDAP S.A – EYATH S.A).

At national level, WFD is transposed to the Greek national legislation with the Law 3199/2003 for the “Protection and Management of Water” in compliance with the Water Framework Directive 2000/60/EC and the Presidential Decree 51/2007 “Establishing measures and procedures for the integrated protection and management of water in accordance with the provisions of Directive 2000/60 / EC”.

The Water Directorates from the Decentralized Regional Authorities gather all the data and deliver regional reports which are elaborated by the General Secretariat which reports the results at national level. The final aim is to make proposals to the water utilities to take additional measures towards the direction of water efficiency, water saving and reducing water production cost.

The National Association of Municipal Water Supply and Sewerage Companies (EDEYA) has also provided some guidelines to its members (water utilities) for the elaboration of the Water Balance and in general water audit (<https://www.edeya.gr/2013-09-23-10-58-06/2013-09-23-11-11-03/udatiko-isozugio>).

In general, there is no specific legislation regarding water use efficiency or any determined level for Non-Revenue Water, as it happens in other European countries such as France and Cyprus.

#### 4 Identified gaps in current policy framework or approach

The identified gap in current water use efficiency policy in Greece are the following:

- Absence of specific national or regional policy on water use efficiency;
- Lack of targets for water efficiency such as for NRW or water losses levels;
- Although the measures included in the Programmes of Measures of the River Basin Management Plans include the reduction of water losses, there are no specific activities described related to water use efficiency;
- Lack of national or regional data on water use efficiency with the exception of scientific studies.

#### 5 Lessons learnt, lessons from practice

The scientific team elaborated the deliverable 4.1 providing the methodology for water use efficiency increase. The first step towards this goal is the elaboration of the water balance and the identification of NRW causes. Then based on the NRW causes several measures are presented. The water operators can choose among the measures based on the criteria they set, such as economic ones, cost-benefit ones, criteria related to the efficiency of the measure or the disturbance of the consumers, etc. During the implementation of the WATER RESCUE project the beneficiaries implemented several measures for the reduction of NRW and increase the water use efficiency. Such measures include the speed and quality of repairs and the replacement of water pipes targeting real losses, the reliable estimation of revenue water, etc.



## 6 Recommendations for policy makers

The recommendations for policy makers related to water use efficiency should include the establishment of an action plan in order to identify the problem and test the measures in pilot actions in order to examine their efficiency. Then the water utilities should communicate their findings and the lessons learnt from their pilot actions to other utilities with similar characteristics or problems which in turn should elaborate ex-ante and ex-post studies. National authorities, using the results from the elaborated regional studies can elaborate national studies setting related targets. At European level, EUREAU can provide guidance to the national organizations and seek funding for such measures for the water utilities. The action plan in brief is given below:

Local Level	<ul style="list-style-type: none"> <li>•setting the pilot area and the pilot action</li> <li>•pilot action implementation - use own funds or cooperate in a programme and receive funding</li> <li>•evaluation of the pilot action results - ex ante and ex post evaluation analysis</li> <li>•proposal preparation for the extension of the activities to the whole water supply system</li> </ul>	FUNDING: regional resources or national resources and/or own funds
Regional Level	<ul style="list-style-type: none"> <li>•implementation of similar activities in water utilities with similar characteristics or problems</li> <li>•elaboration of a regional study - ex ante and ex post evaluation</li> </ul>	FUNDING: Regional Operational Programme or national funds
National Level	<ul style="list-style-type: none"> <li>•regional measures adoption at national level</li> <li>•elaboration of national studies using as input regional and local studies and their results</li> <li>•National authorities to set specific national or regional targets</li> </ul>	FUNDING: National funds, e.g. sectoral from the ministries involved
EU Level	<ul style="list-style-type: none"> <li>•EUREAU uses the studies' results to ensure funding</li> <li>•funds will given with priority to water utilities with low NRW and water footprint levels</li> <li>•transnational evaluation: use of a transnational benchmarking scheme</li> </ul>	FUNDING: from the EU

**Figure 2.** Policy recommendations in the form of an action plan for water utilities at local, regional, national and EU level

## 7 Social, Economic, Environmental Benefits

The increase of water use efficiency has direct economic and environmental positive impacts. Reducing water losses, water as a natural resource is protected and the pressure set to water resources is reduced. Reduced NRW levels provides economic benefits to the water utility as less water volume is abstracted, treated and distributed. Also, reduction of apparent losses means direct economic benefits as larger water volumes are registered and water theft is reduced. When the level of NRW is reduced, then the full water cost is reduced, meaning the water price is lower. This is a social benefit as the consumers pay less for the same amount of water consumed.

## 8 Comments

No comments.

## Appendix A:

## WATER RESCUE

Water resources efficiency and conservative use in drinking water supply systems

**Interreg**  
**Greece-Bulgaria**  
**WATER RESCUE**



European Regional Development Fund

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**WP**                      **6 Policy Recommendation**

**Deliverable**                      **6.4.1 Joint Water Efficiency Policy Recommendation**

*Tool*                                      *Questionnaire*

**Project Beneficiary**    **PB4**  
**No**

**Beneficiary**                      **Municipality of Kardzhali**  
**Institution**

The Project is co-funded by the European Regional Development Fund (ERDF) and by national funds of the countries participating in the Cooperation Programme Interreg V-A "Greece-Bulgaria 2014-2020".

*The contents of this report are sole responsibility of the Municipality of Kardzhali and can in no way be taken to reflect the views of the European Union, the participating countries the Managing Authority and the Joint Secretariat.*

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Name of the organization/institution: Municipality of Kardzhali

Beneficiary number: PB4

## 1 Policy Recommendation Objective

Please select one or more from the below, as the objective of this policy recommendation for your organization:

- (a) There is a need for the introduction of new legislation regarding water efficiency
- (b) There is need for modifications to existing laws regarding water efficiency
- (c) It is a new strategy for government
- (d) It is a change in direction of an existing strategy**
- (e) It is to improve an existing policy or service
- (f) It is to draw attention to a local issue
- (g) Other (please describe)

## 2 Key Stakeholders List

Please provide a list of the key stakeholders at:

- (a) Local or Regional level;
- (b) National level;
- (c) European level.

The list should contain the names of the stakeholders, their positions and their contact details (phone numbers and e-mail addresses).

The main responsibilities for water management and water supply and sewerage are shared among the following institutions:

The Ministry of Regional Development and Public Works is responsible for the overall policy related to the design, construction and operation of water supply and sewerage systems in the country. The Minister represents the state in water supply and sewerage companies with over 50% state share. The Ministry also coordinates water association activities and provides methodological guidance on the preparation of the water supply and sewerage Master Plans.

The Ministry of Environment and Water (MoEW) is responsible for the management and the distribution of water resources at the national level. The Minister issues the permits for water-taking of mineral water – exclusive state property. The MoEW is also responsible for environmental protection and the implementation of the Operational Program Environment, under which water and wastewater infrastructure is funded.

The Council of Ministers defines the state policy in the water supply and sewerage sector as part of the country's water policy and the National strategy for development and management of the water sector in Bulgaria. The Council of Ministers approves a Strategy for development and management of the water supply and sewerage sector in Bulgaria for a period of at least 10 years. The strategy defines the main objectives, priorities, stages and necessary resources and sources of funding for the construction

and development of water supply and sewerage systems and for improvement of water supply and sewerage service quality. The policy in the water sector is implemented by: 1. The Minister of Regional Development and Public Works, 2.

Municipal councils and mayors of municipalities.

The Ministry of Health is responsible for the control on the quality of water intended for drinking and household needs, the quality of mineral water intended for drinking or used for prophylactic, therapeutic and hygienic purposes, including bottled mineral water in the commercial network and the quality of water intended for bathing.

Basin Directorates undertake water management at the basin level. There are four basin directorates: (i) Danube Basin Directorate – Pleven, (ii) Black Sea Basin Directorate – Varna, (iii) West Aegean Basin Directorate – Blagoevgrad and (iv) East

Aegean Basin Directorate – Plovdiv. Directorates develop River Basin Management Plans and Flood Risks Management Plans. They are also responsible for issuing permits for water use and abstraction, for controlling the compliance with the parameters set in these permits, for controlling the activities in river beds, and for water quantity and quality monitoring. Their management of water is based on basin principles.

Water Associations are non-profit legal entities. They manage water supply and sewerage systems within the boundaries of a designated territory in the cases where water supply and sewerage system ownership is divided either between the state and one or more municipalities or among several municipalities. If the WSSC system, which falls within the specified territory, is the property of a single municipality, the management is performed by the municipal council.

The governing bodies of a Water Association include a General Assembly, which consists of representatives of the state (District Governor), and the municipality(ies), with the district governor being the chairman. In the cases where the state and more than one municipality participate in the Water Association, the state is entitled to 35 per cent of the votes, and the other 65 per cent of the votes are allocated among all municipalities in proportion to their population. The funds necessary for the Water Associations operation are provided by the state and municipalities according to the proportion of their voices.

Regarding the Water Act, Water Associations are responsible for the preparation of the regional Master Plans and the investment programmes attached to the plans.

Assignment and approval of these specific Master Plans is made by the MRDPW. The regional Master Plans are accepted and approved by the MRDPW only after they are endorsed by the respective Water Association or Municipal Council.

Water supply and sewerage companies (WSSC) (referred to as ViK, VKS, VKTV or INFRASTROI in the Central Region) are responsible for the operation, management and maintenance of water supply and sewerage facilities in the settlements as well as the provision of water supply and sewerage services to consumers. A WSSC is a commercial, state or municipal company – a legal entity, which has signed a contract with the chairman of the corresponding Water Association or with the mayor of the respective municipality. The term of the contract with a WSSC, signed in accordance with the Water Act, cannot be longer than 10 years, provided that it does not include an obligation for the WSSC to build new water and sewerage infrastructure; or 15 years, if it obliges the WSSC to undertake construction of new infrastructure. In all other cases, the procedure and selection of a water operator as well as the signature of the contract is carried out in accordance with the Concession Act.

Municipalities are direct beneficiaries of the OP "Environment". The mayor of a municipality develops and implements the policies related to planning, management, construction, reconstruction and modernization of water supply and sewerage networks and facilities that are municipal property.

Municipal councils control the municipal participation in water supply and sewerage companies (in those companies, in which the municipalities have shares). They also approve municipal development plans and mayor's statements regarding the business plans developed by WSSCs.

The State Energy and Water Regulatory Commission (SEWRC) is responsible for regulating the tariffs, affordability and quality of water supply and sewerage services under the Water Supply and Sewerage Services Regulation Act.

The Environmental Executive Agency under the Minister of Environment and Water guides the National environmental monitoring system.

### 3 Current Policy Framework or approach

Please describe in detail which is the policy framework right now regarding water quality in your region and your country. Please provide any laws (description) or any other policy framework text.

The Water Act (WA): The WA (SG 67/27.07.1999; last proposal for amendment April 2012) is the main legal act in Bulgaria that sets out the relations in the management of water as a nation-wide natural resource.

- New Draft Water Law: Draft Law on amendment and supplements to the Water Act, which has been prepared in April 2012.
- Draft National strategy on management and development of the water sector: It has been elaborated according to the requirements of art. 151 of the WA.
- Environmental Protection Act (EPA): The EPA (SG 91/25.09.2002) is the basic act concerning all environmental components – air, water, soils, ground, landscape, natural sites, biodiversity and their interrelation.

Other relevant policies and regulations are:

- State policy for protection of the environment
- The Regulation of Water Supply and Sewerage Services Act (RWSSSA)

The main Directives of the European Union concerning the water and wastewater sector are listed below (see Appendix 1-3 for more details):

- The Water Framework Directive 2000/60/EC establishing a legal framework to protect and restore clean water across Europe and ensuring its long-term, sustainable use.
- Directive 91/271/EEC on urban waste-water treatment
- Directive 75/440/EEC concerning surface water used or intended for the abstraction of drinking water
- Directive 2006/118/EC concerning the protection of groundwater from pollution and worsening
- Directive 2006/7/EC concerning the quality of bathing water
- Directive 1975/EC concerning the bathing waters quality
- Directive 98/83/EC concerning the quality of water intended for human consumption



- Directive 2006/44/EO on the quality of fresh waters needing protection or improvement in order to support fish life and Directive 2006/113/EO on the quality required of shellfish waters
- Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources
- Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances
- Directive 2006/11/EC on water pollution caused by certain dangerous substances discharged into the aquatic environment of the Community and seven daughter Directives
- Directive 85/337/EEC on Environmental Impact Assessment
- Directive 2004/35/EO on environmental liability with regard to the prevention and remedying of environmental damages
- Directive 90/313/EEC repealed by Directive 2003/4/EC on public access to environmental information
- Directive 2001/42/EC on environmental impact assessment of certain plans and programmes
- Directive 80/777/EC on rapprochement of member states legislations concerning exploitation and selling of natural mineral waters
- Directive 2003/40/EC on making list, concentration limits and requirements for show-cards about the natural mineral waters components and conditions for the use of ozone treated air on natural mineral and sources waters
- Directive 2008/56/EC on EC action framework creation for the maritime environment policy
- Directive 2007/60/EC on evaluation and management of flood' risk
- Directive 92/43/EEC on protection of natural habitations and wild flora and fauna
- Directive 2009/90/EC on determination according to Directive 2000/60/EC of technical specifications for chemical analysis and monitoring of water status
- Directive 86/278/EEC on environment protection and especially of earth after using sludge from waste water treatment in agriculture
- IPPC Directive 2008/1/EC ("Integrated Pollution Prevention and Control") aims to achieve a high level of protection of the environment through prevention and reduction of integrated pollution from a wide range of industrial and agricultural activities. It is the codified version of Directive 96/61/EC of 24 September 1996. The IPPC Directive will gradually be replaced by Directive 2010/75/EU on industrial emissions directive called IED. This new directive brings together in a single text seven separate directives on industrial emissions. IED Directive came into force January 6, 2011 and must be transposed by January 7, 2013
- Directive 2008/98/EC of 19 November 2008 on waste and repealing certain Directives is the relevant Solid Waste Directive mentioned thereafter

The international agreements and conventions in the field of water management and those with water reference in the field of environment protection are:

- Convention for Cooperation for Protection and Sustainable Use of Danube River, ratified in 1999 (SG, no 30 of 1999), enforced on 6.04.1999

- Convention for Protection of Black Sea against Pollution, ratified in 1992 (SG, no 99 of 1992), enforced on 15.01.1994
- Convention for Protection and Use of Cross border Water Streams and the International Lakes, ratified in 2003 (SG, no 86 of 2003), enforced on 26.01.2004
- Convention for Wetlands of International Importance, especially as habitats for water birds (Ramsar Convention), ratified in 1974, enforced on 24.01.1976
- Convention for Environmental Impact Assessment in Cross Border Context, ratified in 1995 (SG, no 28 of 1995), enforced on 10.09.1997
- Agreement between the European Community and the Republic of Bulgaria in relation to the participation of the Republic of Bulgaria in the European Environmental Agency and the European Network for Information and Monitoring, ratified in 2000

#### 4 Identified gaps in current policy framework or approach

Are there any gaps in the current water quality policy that you have identified in your country or region? What are these gaps? Please describe.

It is striking that water losses in the water supply systems of ViK Kardzhali OOD are too high, but not unusual for the water supply in Bulgaria. Losses within that range indicate poor condition of the water supply systems, in terms of their physical state (failures, leaking pipes. etc.), as well as with regard to water metering accuracy (i.e. water produced and consumed).

Based on the assumptions for unauthorized consumption and metering inaccuracies it can be assumed that the actual domestic consumption exceeds the officially billed consumption.

#### 5 Lessons learnt, lessons from practice

From the WATER RESCUE project implementation and specifically your pilot action, there are lessons learnt. Please describe the results from the pilot action and the lessons learnt (e.g. what to avoid, what to pay attention to, etc.)

The flowmeters included in the project will help to locate sections of the water supply system where there is a suspected loss or theft of water, and after their installation very accurately and quickly it will be possible to identify possible accidents in those sections.

#### 6 Recommendations for policy makers

What are your recommendations for water quality for:

- Stakeholders;
- Policy makers and regulators at national and European level;
- Water utilities at regional and national level.

Systematic measures should be undertaken to reduce losses.

The measures proposed for reducing real/physical losses are as follows:

- Replacement of old water transmission (external) mains.
- Replacement of old water distribution pipelines and the service connections to them

- Timely repair of failures on the water pipelines.
  - Systematic detection, localization and repair of leakages (breakdowns)
- The activities necessary for reducing commercial losses are:
- Installation of water meters on all water transmission mains after the water sources.
  - Installation of water meters on feeding pipes of reservoirs
  - Implementation of the programme for verification and replacement of water meters of domestic consumers.
  - Detection and interruption of unauthorised water connections

## 7 Social, Economic, Environmental Benefits

Please provide all benefits: social, economic and environmental, your recommendations will have. Give practical examples how the recommendation will affect the real world. Also, please describe how these recommendations will affect climate change impacts.

Bulgaria, as member of the European Union (EU), is committed to improve environmental quality in order to achieve compliance with the EU Acquis Communautaire. In this respect, Bulgaria has adopted most of the Acquis in the field of environmental protection. The fulfilment of the commitments made by Bulgaria in the negotiation process for Chapter 22 – Environmental Protection, involves the implementation of major investment projects in environmental infrastructure.

Before Bulgaria's accession to EU, part of the funds needed for environmental investments were available through different European programmes (i.e. PHARE, ISPA, SAPARD) or through projects financed by International Financing Institutions (IFIs) (like: EBRD, EIB, WB, etc.). After 1st of January 2007, Bulgaria has continued to receive EU financial support from the Structural and Cohesion Funds (SCF). In order to ensure an efficient absorption and use of EU funds, the Bulgarian Ministry of Environment and Water (MoEW), as Managing Authority for the Operational Programme (OP) "Environment", prepared a strategic document for the programming period 2007 – 2013 developed in line with the Community Strategic Guidelines (CSG); the National Development Plan (NDP); the National Environmental Strategy 2005- 2014; the National Strategic Reference Framework (NSRF); the National Waste Management Programme 2009-2013; the National Strategy for Management and Development of the Water Sector 2004 – 2015; and the programmes for the implementation of the requirements of different "heavy" directives, elaborated in 2003, such as 91/271/EEC concerning urban waste water treatment. On the basis of the analysis of the current situation, the OP "Environment 2007-2013" sets the country priority areas for the environmental sector to be implemented and financed by the European Union through the Cohesion Fund and the European Regional Development Fund. Priority axis 1 concerns the improvement and development of water and wastewater infrastructure in settlements with over 2,000 population equivalent (PE) and in settlements below 2,000 PE within urban agglomeration areas. The priority axis is based on the purpose of Council Directive 2000/60/EC laying down the framework for community activities related to water - Water Framework Directive (WFD) as well as the purposes of Council Directive 91/271/EEC for urban waste water treatment. During the negotiations under Chapter 22, two transitional periods have been negotiated with regard to the implementation of the requirements of Directive 91/271/EEC, which are as follows:

- Till 31 December 2010 – for all agglomerations over 10,000 PE (85 no in total);
- Till 31 December 2014 – for all agglomerations between 2,000 and 10,000 PE (273 no in total).

This requires measures that include:

- Water supply: extension, reconstruction, modernization, NRW reduction programmes, as well as construction of Drinking Water Treatment Plants (DWTP), reservoirs.

- Sewerage: extension, reconstruction and modernization, as well as construction of new sewerage systems including urban Waste Water Treatment Plants (WWTP), septic tanks, soak ways.

According to the Report for Implementation of Directive 91/271/EEC by the end of 2010 issued by the MoEW, there is a delay in the fulfilment of the Directive requirements for agglomerations above 10,000 PE. This imposes to give first priority to the design and construction of sewerage networks and urban WWTP for agglomerations over 10,000 PE.

Joining the EU in 2007, Bulgaria was urged to reform the water sector and adopt stricter regulations and environmental standards. The European Commission requested from Bulgarian an urgent action plan for reform in the water infrastructure sector. As a result, the Ministry of Environment and Water prepared a strategy and completed a map for the water supply and sewage sector development, in coordination with other ministries, regional authorities, municipalities and ViK operators for most efficient planning, anagement and operation of the water infrastructure.

At present, the water operators providing water supply and sewerage services in the country are state, municipal or mixed commercial companies, which face the challenges of the reform launched in the water sector, and triggered by the need to resolve the fragmented ownership of water assets. The reforms in the water sector envisage that the ownership on water infrastructure should be public state and public municipal, while the management of water supply and sewerage system should be performed by the water supply and sewerage associations.

This Master Plan (MP) is the first important step giving the framework for the development strategy of the municipalities in the water supply and sewerage sector for the period 2014-2038. An identification of necessary investment measures to achieve full compliance with relevant EU Directives and other objectives defined in the Terms of Reference is given in the present document, as well as a prioritisation and phasing of these measures in short, medium and long term. Special attention is paid to the preparation of the short term investment programme intended to be financed by the next Operational Programme "Environment 2014-2020".

## 8 Comments

Please provide any comments.

## Appendix A:

## WATER RESCUE

Water resources efficiency and conservative use in drinking water supply systems

**Interreg**  
**Greece-Bulgaria**  
**WATER RESCUE**  
European Regional Development Fund



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**WP**                      **6 Policy Recommendation**

**Deliverable**                      **6.5.1 Joint Water Efficiency Policy Recommendation**  
*Tool*                                      *Questionnaire*

**Project Beneficiary**    **PB5**  
**No**

**Beneficiary Institution**                      **Municipality of Gotse Delchev**

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**Name of the organization/institution: Municipality of Gotse Delchev**

**Beneficiary number: PB5**

## 1 Policy Recommendation Objective

Please select one or more from the below, as the objective of this policy recommendation for your organization:

- (a)  There is a need for the introduction of new legislation regarding water efficiency
- (b) There is need for modifications to existing laws regarding water efficiency
- (c)  It is a new strategy for government
- (d) It is a change in direction of an existing strategy
- (e) It is to improve an existing policy or service
- (f)  It is to draw attention to a local issue
- (g) Other (please describe) – current situation in water sector of Bulgaria is pretty much complicated. Most of the utilities are regional controlled by Ministry of Regional Development through local water associations. At the same time we still have local municipal Water Operators controlled by municipalities. Ministry of Environment is dealing with water usage permits and permits for water discharge. On the top of everything we have a Water Regulator which is controlling price of water based on certain KPIs few of them directly related with water efficiency. Taking all this into consideration main problem is the mixture of responsible of different institutions in water sector. It will be worthy to have one body responsible for water operator applying strategies including water efficiency strategy. This pass through a national strategy for water efficiency and individual approach for each region depends on its specifics.

## 2 Key Stakeholders List

Please provide a list of the key stakeholders at:

- (a) Local or Regional level – water association if water operator is regional or municipality if water operator serves only certain municipality;
- (b) National level – Ministry of Regional Development and Ministry of Environment;

Regional Level	Responsible person	Contacts
Water Association of Blagoevgrad – municipalities of Blagoevgrad, Gotse Delchev, Bansko, Razlog, Garmen, Satovcha, Simitli, Strumyani, Hadjievo, Yakoruda	Governor – Бисер Михаилов	Info@bl.government.bg +359 73 88 14 01
Municipality of Petrich – responsible for water Operator proving water supply and sewerage services for the territory of municipality of Petrich	Deputy manager – Yanko Karagogov	ykaragogov@vik-petrich.eu +359879 947616
Municipality of Sandanski – responsible for water Operator proving water supply and sewerage services for the	Deputy manager – Krum Arigirov	uvex_sandanski@abv.bg +359 746 3 21 18



territory of municipality of Sandanski		
Municipality of Kresna – responsible for water Operator proving water supply and sewerage services for the territory of municipality of Kresna	Deputy manager – Yordan Lazarov	vik_krecna@abv.bg +359 74332042
<b>National Level</b>	<b>Responsible person</b>	<b>Contacts</b>
Ministry of Regional Development	Deputy Minister – Nikolay Nankov	NNankov@mrrb.government.bg +359 2 94 05 900

(c) European level – European commission.

### 3 Current Policy Framework or approach

Water use efficiency is regulated by Water Law which says that:

- Water must be used in a sustainable way through long term conservation of available water resources
- Complex, multiple and efficient use of water resources
- Economical regulators must be implemented for achievement of sustainable water use and protection of water resources

Management of the waters in the Republic of Bulgaria including control of water usage and discharge takes place at the national and basin level. Pool basins and basin councils are created for basin management. The Basin Directorate is headed and represented by a Director. The activity, the organization of work and the composition of the Basin Directorate is determined by Regulations. In 2002, under Art. 153 of the Water Act and in accordance with Article 3 (1) of Directive 2000/60 / EC, four directorates for river basin management have been established at the Ministry of Environment and Waters:

- **Danube Region with Pleven center** – covering the water catchment areas of the Iskar, Erma, Nishava, Ogosta and West of Ogosta, Vit, Osam, Yantra, Rusenski Lom and Danubian Dobrudjan rivers;
- **Black Sea Region with the center of Varna** – covering the area east of the underground waterbed of the Malmvangan aquifer and the catchment areas of the rivers flowing into the Black Sea from the north to the southern border, including the internal sea waters and the territorial sea. The Black Sea Basin Directorate includes the territory of 46 municipalities from 8 administrative districts with a population of 1 149 million inhabitants;
- **East Aegean Region (IBB)** with a center in Plovdiv – for the catchment areas of the rivers Tundzha, Maritsa, Arda, Byala Reka;
- **West Aegean region (BDB)** with Blagoevgrad center – for the catchment areas of the Mesta, Struma and Dospat rivers.

### 4 Identified gaps in current policy framework or approach

There are two main gaps in current water use efficiency policy:

- **Lack of national policy for water use efficiency** – Water Law says that water use must be efficient but specific parameters of that efficiency are missing. Regional Basin directorates are responsible to control amount of water which is used from water source according water user permit and quality and amount of water discharged back according water discharge permit. They are not responsible to access if the amount of water which is used is relevant to the population or industry which is served and they don't apply any strategies for reduction of water use, water conservation or increase of water efficiency. Water regulator

imposes and controls implementation of some indicators related with water use efficiency but this is more related with Business planning rather than clear water efficiency approach.

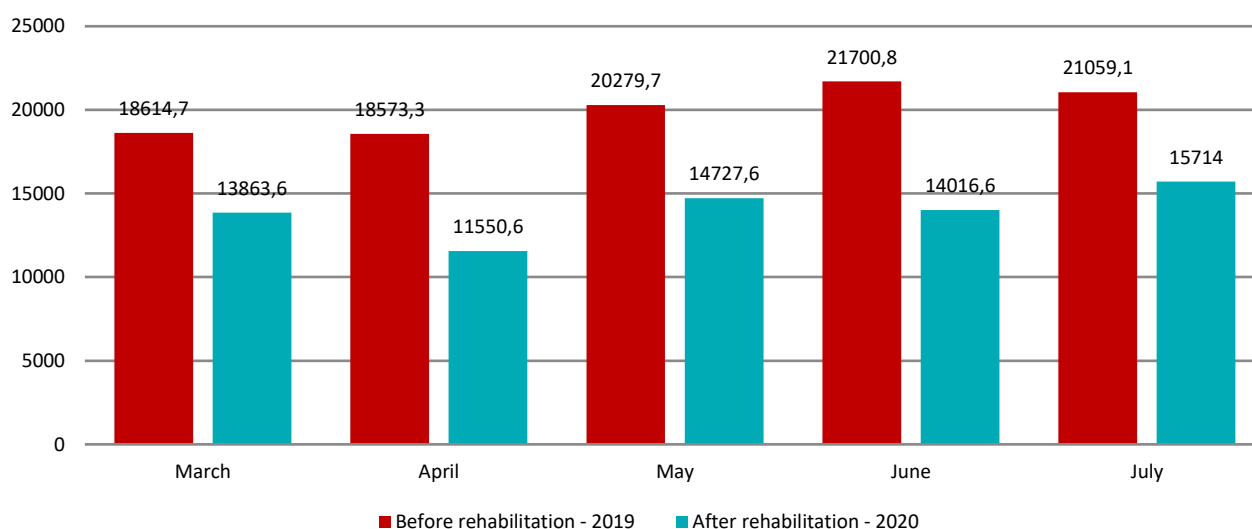
- **Lack of a differentiated approach** – the only indicators which has something common with water efficiency are too common and they don't take under consideration regional and local circumstances. Apart from need of national strategy for water efficiency current available indicators must be upgraded and to take into account all the features of the area where they are applied.

## 5 Lessons learnt, lessons from practice

Main problem of water supply networks in Bulgaria and in particular the one in Gotse Delchev is high level of real water losses. At time water sector is systematically underfunded and limited budgets for investments in rehabilitations must be used in the most efficient way. Within the project our team based on real measurements performed succeeded to assess real water losses and to consider separately a certain part of city water supply network and to prove the need to rehabilitation there. This is an illustrative example how targeted actions in the most critical part of the network bring significant results in the conditions of impossibility to replace the whole network of a city.

As a result net amount of supplied water in the section which was part of the project is significantly reduced which is a clear example of water use efficiency:

Comparison of supplied water in DMA before and after reconstruction - 2019 vs 2020



Time period	Before rehabilitation - 2019	After rehabilitation - 2020	Reduction in supplied water in DMA
March	18614,7	13863,6	26%
April	18573,3	11550,6	38%
May	20279,7	14727,6	27%
June	21700,8	14016,6	35%
July	21059,1	15714	25%

Results from reduction of net amount of water supplied for that section is that real water losses are reduced with 9%.

Results which are achieved clearly demonstrate that final goal – reduction of real water losses can be achieved step by step with targeted actions in certain parts of the network in case that overall reconstruction is impossible.

## 6 Recommendations for policy makers

What are your recommendations for water use efficiency for

- (a) Stakeholders – stakeholder should be more active in following level of water use efficiency and to require certain actions to be taken for improvement of that process;
- (b) Policy makers and regulators at national and European level – Bulgarian water sector needs a long term strategy for water use efficiency which takes into account all local and region specifics. At European level it is obligatory European commission to introduce different KPI to assess real results from money which are invested in water infrastructure in different countries;
- (c) Water utilities at regional and national level – water utilities must be more responsible when it comes for water use efficiency. Currently their main focus is water supply, drainage and waste water treatment but they need to improve their engineering capacity and to start considering water use efficiency as key responsibility. This process include set up of engineering departments responsible for implementation of solutions which increase water use efficiency;

## 7 Social, Economic, Environmental Benefits

All recommendations given are directly related with improvement of process of water use efficiency and they will affect following aspects of life:

- Social – improved efficiency of water use at national level will increase credibility in water Operators at first place. In addition national strategy for water use efficiency inevitably will make final consumer of water also involved in that process. On the other hand improved efficiency will affect also exploitation and maintenance of strategical water object and will make them much more reliable in a long term. All this will bring to the society confidence and predictability in water supply service.
- Economical – investment in targeted measures in right time pay off many times over in the future. Well considered strategy for improved efficiency in water use will put on focus investments in strategic measures and objects and this will protect local municipalities and Government from emergent investments in case of water shortage in future
- Environmental – national strategy for water use efficiency must cover not only water usage but quality of discharged water as well. Efficiency in process of waste water discharge is of a key importance for environment. In addition improved efficiency in water use will decrease quantity of water which is extracted from the environment for water supply and industrial purposes.

## 8 Comments

Please provide any comments.

## Appendix A: