

Bulgaria

The European Commission and the OECD jointly review investment needs and financing capacities for water supply, sanitation and flood protection in each of the European Union's 28 member countries¹. A fact sheet was developed for each country. Each fact sheet: (i) highlights the main drivers of future expenditure and quantifies projected investment needs; and (ii) analyses past sources of financing as well as capacities to finance future needs.

The analysis reflected in the fact sheets aims to support cross-country comparisons. For some indicators, trade-offs had to be made between reporting the most up-to-date and accurate data for each individual country and using data available for all countries in order to support such cross-country comparisons. The fact sheets were reviewed by country authorities and have been revised to reflect comments as much as possible. Inaccuracies on selected items may remain, which reflect discrepancies between national and international data sources.

A full methodological document will be published to explain in detail the sources, categories and methods used to produce estimates. In a nutshell:

- Current levels of expenditure (baseline) on water supply and sanitation are based on a range of data sets from Eurostat, which combine water-related public and household expenditures.
- Projections on future expenditures for water supply and sanitation are driven by the growth in urban population. Additional scenarios for water supply and sanitation were developed to factor in such drivers such as compliance with Drinking Water Directive (DWD), Urban Wastewater Treatment Directive (UWWTD) and emerging EU water directives.
- The paucity of data on current levels of flood protection expenditures did not allow for monetisation of projected future investment needs. Projections of growth rates of future expenditures for flood protection combine estimates of exposure of population, assets and GDP to risks of coastal or river floods.
- The characterisation of past sources of financing in each country is derived from baseline data on current levels of public and household expenditures, debt finance and EU transfers.
- Countries' future financing capacities are approximated by analysing room for manoeuvre in 3 areas: i) the ability to raise the price of water services (taking into account affordability concerns); ii) the ability to increase public spending; and iii) the ability to tap into private finance. Affordability analysis is based on water-related household baseline expenditures, not on average tariffs (which are highly uncertain, inaccurate and not comparable across countries).

¹ Further information and project outputs can be found on the websites of the European Commission and the OECD.

The future costs of diffuse pollution, compliance with the Water Framework Directive, adaptation to climate change, contaminants of emerging concern, urban floods from heavy rains, as well as the potential of innovation to minimise future financing needs are explored qualitatively and will be reflected separately. Costs related to water storage and bulk water supply are not considered.

Key Messages

- Connection to wastewater collection and treatment is an issue
- Issues with renewal of existing assets, O&M and efficiency
- Heavy reliance on EC funding. Limited room of manoeuvre to increase domestic financing capacities
- Increase risks of flooding due to climate change, storm water and high run-off.

Context

Bulgaria's level of per-capita GDP is the lowest in the EU, although its economy is expected to grow faster than the member state median over the next five years. While the rate of urbanisation is projected to rise from 75 to 80% by 2050, an overall population decline in Bulgaria implies falling absolute numbers of people in both rural and urban areas.

Overall, Bulgaria is not considered to be a water-stressed country, and projected water demand does not exceed sustainable supply (WB, 2017a). Water abstractions for both agricultural and industrial purposes have significantly fallen since 1990.

Table 1 presents a number of key indicators characterising the country context and features relevant to future expenditures for WSS and flood protection. These indicators are further discussed in the next sections, including those that underpin the projections of future investment needs.

Table 1. Key features relevant to future expenditures for WSS and flood protection

	Indicator	Value (rank if applicable)	Data Source	Year
Economy and Demographics	GDP per capita	EUR 6 800 (28/28)	Eurostat	2016
	Projected GDP growth	2.7% (10/28)	IMF	2016-2022
	Projected urban population variation by 2050	0.9x (26/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 66	Authors based on EUROSTAT	2011-2015
	Population not connected	0.8%	EC	2015
	Annual domestic sector consumption per capita	42.1m3	EUROSTAT	
	Leakage rate for public water supply	57%	EC	2017
	Non-revenue water	c.60%	WAREG	2016
	Compliance with UWWTD Art.3, 4 and 5 (Index)	41% (26/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 2 (24/25)	EC survey	2013-15
	Pop. potentially affected in flood risk areas	n.a.	EC report	2015
	Value of assets at risk (rise 2015-30):	1.9x (19/28)	WRI	2015-2030

Note: A rank of 1 implies best in class.

Main drivers and projections of future investment needs

Water supply and sanitation

Bulgaria has high connection rates by regional and European standards for piped water, at 98% (WB, 2015b). Bulgaria achieves nearly 100% compliance rate for the quality of its drinking water (EC 2017). Surface water is the primary source for drinking water.

Access to sanitation services is still low and Bulgaria demonstrates low compliance rates with the Urban Waste Water Treatment Directive (EC 2017): only 66% of the population is connected to a wastewater collection network, and just 50% to a wastewater treatment plant. Access to sanitation services is a problem for vulnerable populations. For example, the access rate for flush toilets is 50% for the bottom 40% of the population (WB, 2015b).

Much of the water infrastructure in Bulgaria needs rehabilitation or extension. Most water and sanitation infrastructure was built in the 1960s and 1970s, and is in need of repair (WB, 2015b). Bulgaria has a higher level of nonrevenue water than most European countries, which is attributed to physical water loss from aging infrastructure as well as inefficient utility operation (WB 2015b). Water losses, both technical and commercial, are up to 80% for some operators (EurEau 2017).

Bulgaria's WSS sector is not as efficient as other European countries. In addition to high water losses, staff productivity is considered lower than average (EurEau 2017; WB 2015b).

Table 2 projects future investment needs in water supply and sanitation for a business as usual and a compliance scenario. The compliance scenario consists of two dimensions (1) investments needed to comply with the revised DWD, extend access to vulnerable populations and improve network efficiency (reduce leakage); and (2) investments needed to comply with the UWWTD.

Table 2. Projected investment needs – Water supply and sanitation to 2050 (m. EUR)

BULGARIA		Baseline 2015	2020	2030	Total by 2030	2040	2050
BAU water supply and sanitation	CAPEX	174	190	211	-	231	250
	TOTEX	483	474	453	-	433	416
Scenario Compliance + for water supply and sanitation	ADD. CAPEX	-	285	138	2306	-	-
	ADD. TOTEX	-	707	296	5438	-	-
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	17	17	169	-	-
	ADD. TOTEX	-	36	36	363	-	-
Compliance with UWWTD (sanitation)	ADD. CAPEX	-	268	121	2137	-	-
	ADD. TOTEX	-	671	259	5076	-	-

Note: BAU projections on future expenditures for water supply and sanitation are estimated based on the growth in urban population. Additional scenarios for water supply and sanitation are based on drivers relating to compliance the DWD and UWWTD as well as (for water supply) the cost of connecting vulnerable groups and of reduced leakage. The projections do not take into account the age and pace of renewal of water supply and sanitation assets due to the lack of comprehensive and comparable data across EU member countries.

Source: OECD analysis based on Eurostat (water-related public and household expenditure data) for the baseline; United Nations and Eurostat (total and urban population statistics and projections); European Commission (estimates of costs of compliance with revised DWD and of connecting vulnerable groups, leakage rates, and distance to compliance with UWWTD).

Flood risk management

Bulgaria experienced significant flooding in mid-2014 when more than 10 major floods occurred in less than two months. Aid granted from the EU Solidarity fund for flood damages was EUR 10.5 million in 2014 and EUR 6.3 million in 2015 (EC, 2017).

There is a growing awareness of the need for ex ante protection against disaster risks and a number of institutions and policies now deal with emergency response and preparedness. Bulgaria has taken steps toward preparation of a national climate change adaptation strategy, including a vulnerability assessment of sectors most at risk (WB, 2015).

With climate change, precipitation and run-off are projected to decrease only slightly, while the intensity and variability of rainfall and the intervals between wet days will increase, and heat waves will become more frequent. As a result, the risk of flooding will increase, as will the risk of seasonal drought in selected areas (MRRB, 2014).

Table 3 highlights growth factors in future investment needs for protection against (riverine and coastal) flood risks. The increase in the value of assets at risk from future river flood events is higher than in other countries, at around 22% more in 2030 relative to 2015.

Table 3. Protection against coastal and river flood risks: Projected growth rates of investment needs to 2030

	Expenditures to protect against river flood risk			Expenditures to protect against coastal flood risk
	Total growth factors, by 2030			Categories (1-4), by 2030
	Expected urban damage	Expected affected population	Expected affected GDP	
Bulgaria	1,61	0,69	1,43	1

Note: It was not possible to establish a robust baseline of current expenditures for flood protection due to the absence of comprehensive and comparable data across EU member countries. As a result, this table presents projected growth factors in future expenditures. A growth factor is defined as the factor by which current flood risk expenditures should be multiplied in order to maintain current flood risk protection standards in the future (by 2030). For coastal flood, countries were classified in one of four categories of projected coastal flood risk investment needs, in which 1 indicates very low growth of projected investment needs and 4 very high growth of projected investment needs by 2030.

Source: OECD analysis based on the Aqueduct Global Flood Analyzer of the World Resources Institute (river flood impacts by urban damage, affected GDP, and affected population), the global database of FLOOD PROTECTION STANDARDS (Scussolini et al., 2016) (for countries river flood-related protection level), the European Commission Joint Research Centre (change of build-up in areas vulnerable for coastal flooding), a 2010 study by Hinkel et al. (number of people exposed to coastal flooding, and damage costs in the case of a coastal flood event).

Other pressures affecting water quality compliance with the WFD

There has been a gradual improvement in the quality of surface and ground water during the last decade. However, there are still many water bodies at risk and diffuse pollution affects almost half of surface water bodies (EC, 2017). There are significant differences between water basin districts: diffuse sources are the major pressure in the Black Sea district, whereas water abstraction is the major pressure in the West Aegean district. In the Danube district all pressures affect a high proportion of water bodies.

The current River Basin Management Plans have significant gaps. Therefore uncertainty remains about the effectiveness of proposed measures. In addition, navigation and related activities, such as port development or dredging, were not considered in the plans as pressures (EC, 2017).

Past financing strategies and room for manoeuvre to finance future needs

Water supply and sanitation

Capital investments in the sector are below the level needed to maintain the existing infrastructure. EU grants are the main source of funding and they are predominantly focused on constructing sewage and waste water treatment plants and not so much on WSS network maintenance (EurEau, 2017).

Water tariffs cover a little over half of the total financing for the sector, and just cover operational costs (WB, 2017b).

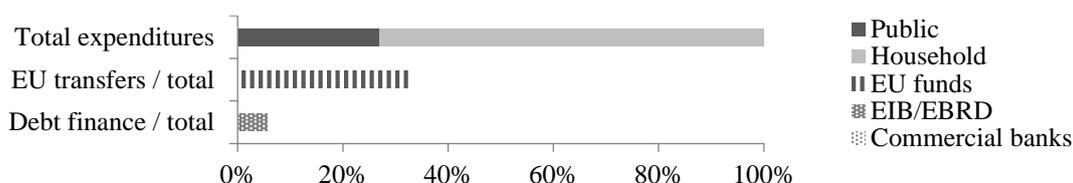
The estimated investment needs (reported under article 17 of the Urban Waste Water Treatment Directive) to reach full compliance with the Directive in Bulgaria amount to EUR 2 969 million (EC, 2017).

According to the 10-year strategy for the sector (2014-2023), rehabilitation and construction of water supply and sewerage networks will require BGN 12 billion (EUR 6 billion), which amounts to 5% of the national GDP (WB, 2015b). EU funds will only cover 30–40% of the

total capital investments needed until 2020. A National Strategy on Water Supply and Sewerage sector funding is currently under development, which will provide different options and expected year for compliance.

Projected population decline raises risks of infrastructures being oversized and costly to operate and maintain, adding to the financial challenge.

Figure 1. Share of annual average expenditure on WSS, by source (2011-15, %)



Source: EUROSTAT (for public and household expenditures), European Commission (for EU transfers), European Bank for Reconstruction and Development, European Investment Bank, IJ Global, Thomson Reuters, Dealogic (for debt finance).

Table 4 indicates that Bulgaria faces significant financing challenge. The country is characterised by major affordability concerns (despite low pricing), combined with limited ability to use either taxes or borrowing to fund public spending, or to tap into its domestic banking sector.

Table 4. Indicators of future financing capacities for water supply and sanitation

	Indicator	Value (rank)	Year	Data Source	Assessment
Ability to price water	Country-level average price for water supply and sanitation / m3 (PPP)	0.3 EUR (24/27)	2010	EC Joint Research Centre (forthcoming)	Low
	Water expenditures in lowest household income decile	3.96% (25/26)	2011-15	Authors based on EUROSTAT	
	Full cost recovery equivalent in lowest household income decile	5.42% (27/28)	2011-15	Authors based on EUROSTAT	
	At-risk-of-poverty rate	22.9% (27/28)	2016	EUROSTAT	
Ability to raise public spending	Tax revenue / GDP	29.0% (3/28)	2016	EUROSTAT	Medium to Low
	Government consolidated debt / GDP	29.0% (3/28)	2016	EUROSTAT	
	Sovereign rating	BB-	2017	Standard & Poor's	
Ability to attract private finance	Domestic credit to private sector / GDP	55% (19/28)	2015	World Bank	Medium

Flood Risk Management

The main source for funding FRMP measures is the state budget. For some measures such as the reconstruction of dams, financing comes from Operational Programme Environment 2014 - 2020.

In 2014, approximately 8% of the 3.6 million homes in Bulgaria have catastrophic insurance for natural disasters, such as earthquakes and floods. Such low insurance penetration implies significant contingent liabilities for the government in the aftermath of a major shock (WB, 2014).

Available data indicates a relatively low share of Bulgarian public spending in total WSS-related capital and operational expenses, which can be explained by the fact that domestic public spending has been fully dependent on EU transfers. Given low levels of water pricing in the country, the high share (70%) represented by households in total expenditures is a symptom of public underspending rather than an indication that Bulgaria has been moving towards full cost recovery through pricing.

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