

Poland

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).

The future costs of diffuse pollution, compliance with the Water Framework Directive, adaptation to climate change, contaminants of emerging concern, urban floods from heavy

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

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

- Moderate pressure on limited water resources.
- Inadequate wastewater treatment leading to pollution and nitrification of Baltic Sea.
- Increasing risks of river and coastal floods.
- Robust financial capacities. EU transfers are large in absolute terms but relatively small compared to domestic sources.

Context

Poland has one of the lowest per-capita GDP in the EU, but is expected to undergo relatively robust economic growth over coming years. Poland sits slightly below the EU-average in terms of population connected to public drinking water supply and also on wastewater treatment levels. Poland faces moderate, though increasing, future flood risks. Climate, geography and climate change

Poland has the 6th largest land area in the EU, with only slow changes to land use, driven by increased forest and built-up coverage and falling farming area. Land use remains dominated by agriculture (59%), although the share of land dedicated to this use is in decline. Forests, woodland and open habitat cover 33% of total area. Artificial areas account for 6% of Poland (EEA, 2017).

Surface waters meet approximately 80% of Poland's water use needs, with limited groundwater uses primarily for drinking water. Industry remains a major user of freshwater, with over half of freshwater abstracted for electricity production alone (OECD, 2015).

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 11 100 (25/28)	Eurostat	2016
	Projected GDP growth	2.8% (9/28)	IMF	2016-2022
	Projected urban population variation by 2050	1.05x (22/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 116	Authors based on EUROSTAT	2011-2015
	Population not connected	12%	EC	2015
	Annual domestic sector consumption per capita	36.8 m3	EUROSTAT	
	Leakage rate for public water supply	24%	EC	2017
	Non-revenue water	c.15%	EurEau	2017
	Compliance with UWWTD Art.3, 4 and 5 (Index)	94% (16/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 3 (17/27)	EC survey	2013-15
	Pop. potentially affected in flood risk areas	11%	EC report	2015
	Value of assets at risk (rise 2015-30):	1.3x (10/28)	WRI	2015-2030

Note: A rank of 1 implies best in class.

Main drivers and projections of future investment needs

Water supply and sanitation

Poland is endowed with limited freshwater resources, with yearly per-capita annual availability of just 1 600 m³, and has a water use intensity roughly double the OECD average. Freshwater resources (mostly rivers and lakes) are thus under medium to high stress. Encouragingly, over the last two decades, total water withdrawals have been growing at a slower rate than GDP (OECD, 2015).

Slightly less than 90% of Poland's population is connected to large or small water supply zones and it demonstrates very high compliance with the EC's Drinking Water Directive. Non-revenue water accounts for about 20% of water supplied, in line with the average of other countries, although cross-country comparisons cannot be made (EurEau, 2017).

Poland remains less than fully compliant with the EU's Urban Wastewater Treatment Directive and is prioritising specific agglomerations and investments in the 2014-2020 planning period (EC, 2017).

The asset renewal rate for water supply and sanitation infrastructure is less than 1%, which, although broadly in line with many other European countries, may be lower than required to maintain current service levels for an extended period of time (EurEau, 2017).

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)

POLAND		Baseline 2015	2020	2030	Total by 2030	2040	2050
BAU water supply and sanitation	CAPEX	2262	2326	2464		2616	2772
	TOTEX	4409	4409	4467	-	4544	4620
Scenario Compliance + for water supply and sanitation	ADD. CAPEX		1131	966	11431		
	ADD. TOTEX		2168	1787	21469		
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX		137	137	1367		
	ADD. TOTEX		285	285	2845		
Compliance with UWWTD (sanitation)	ADD. CAPEX		994	829	10064		
	ADD. TOTEX		1884	1503	18623		

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

Poland is exposed to coastal and riverine flood risks across its entire territory, from climate change and anthropogenic factors. Inland floods are expected to occur more often and be more impactful than coastal floods in future (OECD, 2016). Increased probability of flash flooding due to heavy precipitation is likely to affect many parts of the country (Ministry of the Environment, 2013). In the absence of adaptation, sea level rises over the next century are projected to have a modest negative impact on Poland's GDP (Bosello et al., 2012).

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 river flood events is lower than in other countries, although this remains an important source of future risk.

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	
Poland	2,02	1,13	1,88	3

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

69% of water bodies do not meet the standard of “good ecological status” required by the EU Water Framework Directive (EC, 2017).

Inadequate treatment of municipal and industrial waste, plus diffuse source pollution from agricultural production, are the major sources of non-compliance with water quality standards (OECD, 2015). Poland contributes to the nitrogen load in the Baltic Sea, primarily from non-compliance with the Nitrates Directive in the agriculture sector (EC, 2017).

Past financing strategies and room for manoeuvre to finance future needs

Water supply and sanitation

Water supply and sanitation are managed by a range of institutions, with overall authority at the national level resting with the National Water Management Authority, which co-ordinates river basin management plans created by the 11 Regional Water Management Boards, established by the recent legislative reforms (2017 Water Law). Water supply and wastewater collection infrastructure are managed at the municipality (*gmina*) level.

Since January 2018, major water users (aquaculture, irrigation, mining, and some electricity generators) are no longer exempt from water abstraction charges, which was not only costly in terms of forgone fiscal revenues, but also did not provide incentives for water conservation. The reforms of the water sector, introduced in 2017, also significantly expanded the list of users and uses subject to fees². The aim of the reform was to ensure, in accordance with Article 9 of the Water Framework Directive, that all users are paying for water and that fee revenues will be used for investments aimed at improving water status. Households connected to water supply and sanitation infrastructure typically pay user charges. Municipal and local

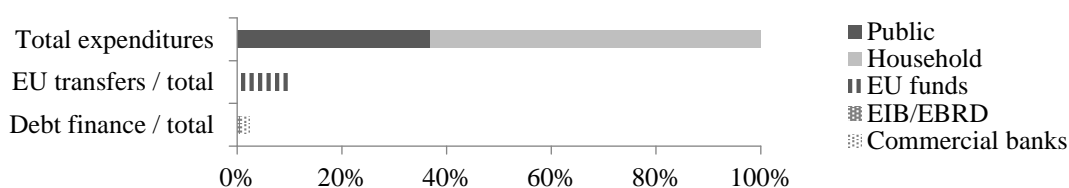
² For example, fees for diminished water retention paid by some real estate owners that had previously been exempt from charges.

governments bear most of the cost of providing water supply and sanitation services. EU and some national-level funding can cover part of these expenses. Reliance on commercial finance is minimal (OECD, 2015).

Poland has been the largest beneficiary of EU Cohesion Policy funds and is forecast to remain so between 2014 and 2020 (EC, 2017). The public sector accounts for about 80% of total investment in wastewater management (OECD, 2015).

As depicted in Figure 1, Poland has been relying more on household than public expenditures to finance WSS-related capital and operational expenses. Slightly over 10% of these expenditures have been dependent on EU transfers. Debt finance has been playing a very limited role.

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 Poland is likely to face affordability constraints if increasing significantly (currently low) water prices³. The authorities, on the other hand, should have some leeway to increase public spending, based on the overall budgetary situation.

³ In December 2017, amendments in legislation governing water use (Acts on Collective Water Supply and Collective Sewage Disposal) established a new regulatory office to oversee water tariffs. The main aim of this amendment is to ensure tariffs are affordable, while also taking into account the financial stability of service providers.

Table 4. Indicators of future financing capacities

	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)	2012	EC Joint Research Centre (forthcoming)	Low
	Water expenditures in lowest household income decile	2.86% (24/26)	2011-15	Authors based on EUROSTAT	
	Full cost recovery equivalent in lowest household income decile	4.54% (25/28)	2011-15	Authors based on EUROSTAT	
	At-risk-of-poverty rate	17.3% (18/28)	2016	EUROSTAT	
Ability to raise public spending	Tax revenue / GDP	34.3% (10/28)	2016	EUROSTAT	Medium to High
	Government consolidated debt / GDP	54.1% (11/28)	2016	EUROSTAT	
	Sovereign rating	BB+	2017	Standard & Poor's	
Ability to attract private finance	Domestic credit to private sector / GDP	54% (20/28)	2015	World Bank	Medium

Flood risk management

The 11 Regional Water Management Boards are responsible for developing flood plans and co-ordinating flood protection activities. Household insurance coverage for flood risk is typically automatic (although not mandatory).

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