Belgium

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 countries[1]. 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 rains, as well as the potential of innovation to minimise future financing needs are explored

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

qualitatively and will be reflected separately. Costs related to water storage and bulk water supply are not considered.

Key messages

- Belgium experiences low water stress on moderate water resources.
- Belgium faces risks of non-compliance with water quality directives due to pressure from agricultural production.
- There is a projected significant increase in the value of assets at risk from river, pluvial, and coastal flooding.

Context

Belgium is a small, largely flat country, with almost the entire country lying in either the Scheldt or Meuse river basins. The rivers account for about 40% of Belgium's annual freshwater availability, with net precipitation accounting for the rest. The major aquifers are in Wallonia, which supplies 55% of the country's water, despite only housing 37% of the population. As such, the other regions are highly dependent on water flows from Wallonia (40% of water in Flanders and 98% in Brussels-Capital).

Belgium's land area is about 50% dedicated to agricultural production, with forests (22%) and residential (16%) areas the next largest land-use types (Eurostat, 2017). This allocation of land use is highly stable, with Belgium's annual land cover change rate of 0.1% amongst the lowest in Europe (EEA, 2017a). Groundwater meets approximately two-thirds of Belgium's drinking water use needs (EurEau, 2017). Industry is the largest user of freshwater resources, accounting for around 85% of total use (WWF, 2018).

Belgium has a comparatively high level of development, shown by its level of GDP per capita, although future real economic growth is expected to be below the EU average.

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 37 500 (9/28)	Eurostat	2016
	Projected GDP growth	1.5% (24/28)	IMF	2016-2022
	Projected urban population variation by 2050	1.18x (12/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 214	Authors based on EUROSTAT	2011-2015
	Population not connected	0%	EC	2015
	Annual domestic sector consumption per capita	26.1 m3	EUROSTAT	
	Leakage rate for public water supply Non-revenue water	17% c.17%	Statistics Belgium EurEau	2017 2017
	Compliance with UWWTD Art.3, 4 and 5 (Index)	99% (7/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 6 (10/27)	EC survey	2013-15
	Pop. potentially affected in flood risk areas	24% (1)	EC report	2015
	Value of assets at risk (rise 2015-30):	3.1x (27/28)	WRI	2015-2030

Note: Rank 1 implies best in class among the EU member countries for which data is available for each indicator.
(1) 16% for Wallonia

Main drivers and projections of future investment needs

Water supply and sanitation

Belgium has taken great strides in meeting the requirements of the EC's Urban Wastewater Treatment Directive, with about 98% of wastewater collected and subject to secondary treatment at the national level. 82% is subject to additional treatment. All big cities comply with the UWWTD, although small agglomerations, in particular in the Walloon region, lag behind (EC, 2017). Belgium has a relatively high intensity of freshwater abstraction as a proportion of available resources and per-capita abstraction above the European average (OECD, 2007; WWF, 2018). Agriculture (animal rearing and use of nitrates), which accounts for less than 5% of water use but over 50% of land use, is causing eutrophication in many surface waters (WWF, 2018; EC, 2017).

Approximately 100% of Belgium's population is connected to drinking water supply, with over 91% connected to Large Water Supply Zones (Eureau, 2017). This reflects past efforts and the extensive degree of urbanisation in the country (>98%). Further, Belgium exhibits very high compliance with the EC's Drinking Water Directive. Non-revenue water accounts for less than 20% of water supplied. This is superior to the average of most other countries, although direct cross-country comparisons cannot be made (EurEau. 2017). The asset renewal rate for water supply and sanitation infrastructure is less than 0.5%, which is lower than in many other

member states and may be lower than required to maintain current service levels for an extended period of time (EurEau, 2017).

Belgium is forecast to undergo positive population growth over the next 30 years, as well as witness a (slight) increase in its already very high urbanisation rate (UN, 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)

BELGIUM		Baseline 2015	2020	2030	*Total by 2030*	2040	2050
BAU water supply and sanitation	**CAPEX**	**1208**	**1278**	**1436**	**-**	**1578**	**1700**
	TOTEX	**2379**	**2444**	**2617**		**2747**	**2834**
Scenario Compliance + for water supply and sanitation	**ADD. CAPEX**	-	**296**	**320**	***3343***	**-**	**-**
	ADD. TOTEX		**596**	**618**	***6552***		
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	50	50	*503*	-	-
	ADD. TOTEX		126	126	*1264*		
Compliance with UWWTD (sanitation)	ADD. CAPEX		246	270	2840		
	ADD. TOTEX		470	492	5288		

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.
Flanders estimates that approximately EUR 100 million are spent each year in replacement investments. To maintain the supra-municipal infrastructure, an increase is expected from 20 million in 2017 to 54 million in 2027.
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

Belgium is at risk of river, pluvial, and coastal flooding across its whole territory, with these risks likely to increase due to both demographic and climate changes. Indeed, the EC forecasts North Sea coastal cities, including Belgian cities, as being amongst the most at-risk of future flooding, although this does not account for existing flood protection (EEA, 2017b). This follows from Belgium's relatively flat topography (OECD, 2007). Belgium is among the European countries facing the largest increase in the value of assets as risk due to possible future riverine flooding (WRI, 2015).

A unique flood risk in Belgium occurs due to the extensive enclosure of water courses in urban areas. In the event of heavy rain, this can cause the system to backup and overflow upstream (OECD, 2007). Ongoing efforts to restore more natural hydromorphology should help to mitigate these risks over time.

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	
Belgium	2,84	3,72	4,57	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

Only about 40% of natural water bodies and no modified/artificial water bodies meet the standard of "good ecological status" or better required by the EU Water Framework Directive (EC, 2017). Diffuse source pollution (notably from nitrates and phosphates) from agriculture is the major sources of non-compliance with water quality standards (EC, 2017).

Belgium is party to international agreements regarding the North Sea and its international rivers basins (Scheldt and Meuse).

Past financing strategies and room for manoeuvre to finance future needs

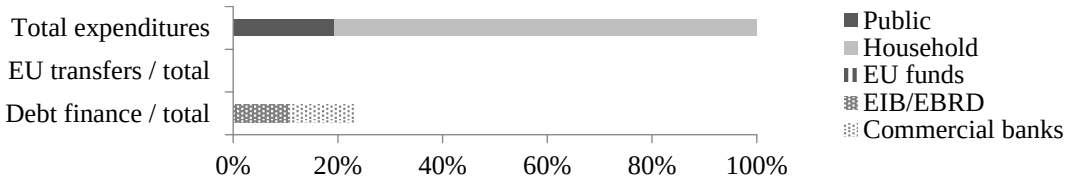
Water supply and sanitation

Belgium relies heavily on pricing to finance WSS-related expenditures. Such pricing has made recourse to significant levels of debt possible to finance upfront capital investments. On that basis, the country has not benefited from nor would have been in need of EU transfers.

Water supply and sanitation is managed at the regional level, within each region's broader environmental management responsibilities (WWF, 2018). The structure of service provision has evolved separately in the regions. The regions also develop plans for water management and flood prevention. In general, there is a regional body/company charged with overseeing the multiple drinking water companies active in each region (OECD, 2007).

Households connected to water supply and sanitation infrastructure typically pay user charges, although the government previously recognised a national right to water by supplying the first block of consumption free of charge. Since a law change in 2016, Flanders has removed the no-cost first block of consumption and moved to a tariff structure with a fixed and two (increasing) variable block components for all domestic water consumption, as set by the water regulator. Nonetheless, the regions all practice full cost recovery principles for drinking water supply (OECD, 2007). Government had borne much of the cost of providing water sanitation services, although the regions have planned to move towards full cost recovery (OECD, 2007).

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 Belgium should be in a position to continue to mainly rely on tariffs (towards full cost recovery), as affordability does not appear to be a concern. Relatively high current levels of overall taxation and, even more so, of consolidated public debt would, however, constrain a significant increase in public spending.

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)	2.2 EUR (15/27)	2013	EC Joint Research Centre (forthcoming)	High
	Water expenditures in lowest household income decile	1.55% (11/26)	2011-15	Authors based on EUROSTAT	
	Full cost recovery equivalent in lowest household income decile	1.92% (5/28)	2011-15	Authors based on EUROSTAT	
	At-risk-of-poverty rate	15.5% (10/28)	2016	EUROSTAT	
Ability to raise public spending	Tax revenue / GDP	46.8% (22/28)	2016	EUROSTAT	Medium
	Government consolidated debt / GDP	105.7% (24/28)	2016	EUROSTAT	
	Sovereign rating	AAA	2017	Standard & Poor's	
Ability to attract private finance	Domestic credit to private sector / GDP	62% (18/28)	2015	World Bank	Medium

Flood risk management

The regional governments are responsible for developing and implementing flood protection plans at a river basin level and have undertaken significant investments in both structural and none-structural (e.g. nature-based) infrastructure.

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