Estonia

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).

[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

- Very high compliance with the DWD but extension of coverage with wastewater collection and treatment facilities remains a challenge, especially in rural areas.
- There is a need to update certain elements of industrial wastewater discharge standards. Groundwater contamination in the oil-shale mining area has a direct impact on public water supply.
- Potential risk of storm surges in coastal zones.
- Heavy reliance on EC funding in the past. Affordability issues may limit the capacity to cover costs for O&M.

Context

Estonia has a per-capita GDP below the EU average but comparatively good economic prospects. Total population is expected to grow marginally until 2020 and decline thereafter. While a sizable percentage of the population lacks connection to water supply infrastructure, a significant increase in the connection rate is not expected due to Estonia's low population density. Estonia performs markedly well as regards service efficiency and wastewater treatment. By 2030, the value of assets at risk from flooding is expected to more than double.

Estonia has a small territory with abundant water resources. The gross freshwater abstraction per capita, mainly for electricity production, increased by about one-fifth since 2000; it was one of the highest in the OECD in 2014 (OECD, 2017). Groundwater is the only source of drinking and industrial water for the majority of towns and settlements in Estonia, with the exception of Tallinn and Narva (WWF, 2018).

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 16 000 (20/28)	Eurostat	2016
	Projected GDP growth	3.0% (7/28)	IMF	2016-2022
	Projected urban population variation	1.03x (23/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 76	Authors based on EUROSTAT	2011-2015
	Population not connected to public water supply	15%	Estonian authorities, for this project	2019
	Annual domestic sector consumption per capita	75 l/d	Estonian authorities, for this project	
	Leakage rate for public water supply	17%	EC	2017
	Non-revenue water	18%	WAREG	2016
	Compliance with UWWTD Art.3, 4 and 5	99.5% (19/28); 99.9% (5/28); 99.9% (4/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 4 per capita (16/25)	EC survey	2013-15
	Population potentially affected in flood risk areas	N/A	EC report	2015
	Expected increase in urban damage	1,39	Authors based on WRI	2015-2030

Note: Rank 1 implies best in class among the EU member countries for which data are available for each indicator.

Main drivers and projections of future investment needs

Water supply and sanitation

Estonia demonstrates very high compliance (99-100%) with the Drinking Water Directive (DWD). For the Urban Waste Water Treatment Directive (UWWTD), Estonia generally demonstrates high compliance rates (94.3% for collection and 97.1% for secondary treatment) (EC, 2016a; EC, 2016b).

However, gaps in public water supply and sewerage treatment remain, despite large investments over the past decade. Wastewater is still not collected in the required quantities and its treatment does not always meet requirements (OECD, 2015).

Overall, there is a clear indication of a rising trend in extreme precipitation events. Groundwater recharge is projected to increase, in particular in the Pandivere Upland. The safe yield of wells abstracting from the upper aquifers is expected to augment, which could make public water supply less costly (OECD, 2013).

According to estimates from Estonian authorities, projected investment needs for water supply and sanitation until 2020 to achieve the compliance with DWD and UWWTD are EUR 49 million for agglomerations under 2000 population equivalent (p.e.) and EUR 54

million agglomerations over 2000 p.e. Projected investment needs until 2030 are EUR 73 million for agglomerations under 2000 p.e. and EUR 80 million for agglomerations over 2000 p.e.

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. A major caveat is the lack of accurate cross-country data on the state of the asset and on whether the business as usual appropriately reflects the need to renew existing infrastructures.

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

ESTONIA		Baseline 2015	2020	2030	*Total by 2030*	2040	2050
BAU water supply and sanitation	**CAPEX**	**54**	**55**	**57**	**-**	**59**	**62**
	TOTEX	**100**	**100**	**100**		**102**	**103**
Scenario Compliance + for water supply and sanitation	**ADD. CAPEX**	-	**33**	**33**	***361***	**-**	**-**
	ADD. TOTEX		**61**	**59**	***652***		
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	4	4	*38*	-	-
	ADD. TOTEX		8	8	*79*		
Compliance with UWWTD (sanitation)	ADD. CAPEX		29	29	323		
	ADD. TOTEX		53	52	573		

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

Eight significant river flooding events occurred in Estonia between 2005 and 2011. Ten floods occurred from coastal waters in 2005 and two floods were due to heavy rainfall that took place between 2000 and 2003 (EC, 2015).

Estonia has undertaken a preliminary assessment of the risk of flooding from all relevant sources (rivers, costal water, surface water flooding form heavy rainfall, dams and reservoirs and groundwater; EC, 2015). The estimated number of properties at high-risk of flooding in Estonia is: 6 708 residents at risk from a 1 in 50 year flood and 9 171 residents at risk from a 1 in 100 year flood. The perception of flood risk is generally low in Estonia (OECD, 2016).

Risk of river flooding may decrease, due to the retreat of snow and ice. However, there may be more surface water flooding due to heavy rainfall as the frequency of extreme storms increases (EC, 2015). Storm surges pose a potential risk in coastal areas (EC, 2009).

Shifting flood regimes may have an impact on infrastructures designed for past climate conditions with stable winters and higher spring floods. Lower river flows in the spring may contribute to possible drinking water quality degradation (OECD, 2013). Estonia reports that changes in land-use have led to a significant reduction in flood risk (OECD, 2016).

Table 3 highlights growth factors in future investment needs for protection against (riverine and coastal) flood risks. Urban floods from heavy rains will be discussed separately (not in the country fact sheet).

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	
Estonia	1,39	0,91	1,77	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 selected pressures affecting compliance with the WFD

According to the first RBMPs, 62% of surface water bodies achieve good or high ecological status or potential. Point and diffuse sources of pollution, flow regulations and morphological alterations contribute to pressure on water bodies (EC, 2017).

As one of the Baltic countries, Estonia has agreed to develop measures to address micro-plastics and urban and storm water discharges to rivers, and to consider cost-effective mitigation measures to reduce legacy pollutants and contaminants of emerging concern, including pharmaceuticals (HELCOM, 2018).

The mining sector is the largest water consumer in the country. Mining operations have considerable impact on the hydrological regime and discharges from oil shale mines contribute to water quality degradation. The contamination of groundwater in the oil-shale mining area has a direct impact on public water supply. Further, pre-treatment standards for industrial wastewater discharges into municipal sewerage systems are outdated and do not cover many important hazardous substances (OECD, 2017).

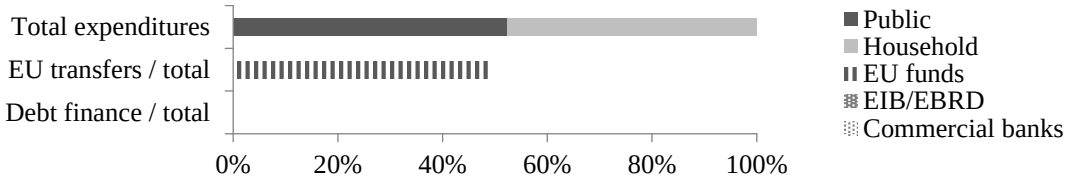
Past financing strategies and room for manoeuvre to finance future needs

Water supply and sanitation

Charges are in place for water abstraction and pollution, but at low rates (OECD, 2017). Funding received from the EU, revenues from abstraction and pollution charges and contributions from local authorities have mostly been used for the reconstruction of obsolete drinking water and waste water treatment systems and for the construction of new systems (NAOE, 2013).

As depicted in Figure 1, Estonia has been relying slightly more on public than household expenditures to finance WSS-related capital and operational expenses. Close to half of all expenditures have been dependent on EU transfers, compared to an average of 13% across member states. WSS investments, in general, have not managed to attract debt finance. However, loans have been used to co-finance many WSS projects in Estonia.

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



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).

According to Estonia's current plan, after 2023, water companies serving larger communities (over 2000 p.e.) will need to be financially self-sustainable and cover the investment needs with water tariffs and loans. All of the remaining major investments in WSS infrastructure will have been implemented with the last EU funds in 2014-2020.

There is an ongoing process of the consolidation of water companies in Estonia accompanied by an administrative reform, which should improve the financial and technical capacity of water operators. The government is supporting this process with improved financing support for regional companies.

Based on the criteria in Table 4, Estonia faces potential affordability constraints, especially if faced with a need to increase water-related expenditures beyond currently low per capita level. The country should, in principle, be in position to rely on increased public spending financed by debt, possibly taxes. Finally, the country's generally relative attractiveness for private finance could be tapped into, pending the design of good quality WSS-related investment opportunities.

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

	Indicator	Value (rank)	Year	Data Source
Ability to price water	Water expenditures in lowest household income decile	1.16% (7/26)	2011-15	Authors based on EUROSTAT
	Full cost recovery equivalent in lowest household income decile	2.42% (8/28)	2011-15	Authors based on EUROSTAT
	At-risk-of-poverty rate	21.7% (23/28)	2016	EUROSTAT
Ability to raise public spending	Tax revenue / GDP	34.7% (11/28)	2016	EUROSTAT
	Government consolidated debt / GDP	9.4% (1/28)	2016	EUROSTAT
	Sovereign rating	AA-	2017	Standard & Poor's
Ability to attract private finance	Domestic credit to private sector / GDP	70% (16/28)	2015	World Bank

Flood risk management

Responsibilities for coastal defences are not clearly defined and laws and regulations governing coastal zones are incomplete. Thus, coastal defences are mainly planned by private land owners or municipalities, which can apply for funding from the national government by means of Regional Development Funds (EC, 2009). Municipalities also frequently provide funding through their own budget.

Private insurance against flood risk is available for residential and commercial properties. Flood insurance availability may be limited in one region in Estonia due to regular flooding (OECD, 2016). Since 2018, there is a new fund available for mitigation measures for flood-prone areas.

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