

## *Cyprus<sup>1</sup>*

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<sup>2</sup>. 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.

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<sup>1</sup> Note by Turkey. The information in this document with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Commission. The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. According to the provisions of Article 1 of Protocol No. 10 on Cyprus, the application of the *acquis* is suspended in those areas of the Republic of Cyprus in which the Government of the Republic of Cyprus does not exercise effective control. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

<sup>2</sup> Further information and project outputs can be found on the websites of the European Commission and the OECD.

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

### Key messages

- Assuring freshwater supply continues to be a challenge, requiring investments in non-conventional water sources.
- Additional investment is required to comply with the UWWTD.
- The recent reform of water tariffs (in 2017) is designed to support moving towards full cost recovery.

### Context

Cyprus sits at the EU median in terms of both per-capita GDP and forecast future economic growth. The share of Cyprus' population living in towns and cities is set to remain roughly stable at 67-70% through to 2050, with the overall population growing steadily over the same time period. Despite near universal connection to water supply, some wastewater treatment challenges remain.

Cyprus is the third largest island in the Mediterranean. With a semi-arid climate and limited natural water resources, Cyprus faces significant challenges related to water scarcity (EC, 2017). The main climate change impact related to persistent drought resulting in freshwater shortage. Over the past 35 years, rainfall in Cyprus has dropped by about 20% and water runoff into reservoirs has declined by 40% (EC, 2009).

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
<b>Economy and Demographics</b>	GDP per capita	EUR 21 300 (15/28)	Eurostat	2016
	Projected GDP growth	2.2% (14/28)	IMF	2016-2022
	Projected urban population variation	1.25x (6/28)	UN	2017-2050
<b>Water Supply and Sanitation</b>	Estimated annual average expenditure per capita	EUR 269	Authors based on EUROSTAT	2011-2015
	Population not connected to public water supply	0%	<a href="#">EUROSTAT</a>	2015
	Annual domestic sector consumption per capita	n.a.	<a href="#">EUROSTAT</a>	
	Leakage rate for public water supply	8%	EC	2017
	Non-revenue water	c22%	<a href="#">EurEau</a>	2017
	Compliance with UWWTD Art.3, 4 and 5	75.9% (28/28); 99.9% (6/28); 100% (1/28)	EC	2014
<b>Flood Protection</b>	Estimated annual average expenditure per capita	EUR 1 (26/27)	<a href="#">EC survey</a>	2013-15
	Population potentially affected in flood risk areas	18%	<a href="#">EC report</a>	2015
	Expected increase in urban damage	2,47	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*

Cyprus demonstrates very high compliance (99-100%) for microbiological and chemical parameters and 96.3% compliance with indicator parameters in the DWD (EC, 2016a).

According to the national report for the 9th reporting cycle (reference year 2014) of the UWWTD, the compliance rates with Articles 3, 4 and 5 were 65%, 85.6% and 85.3% respectively (Neocleous, 2017).

Freshwater shortage has forced the country to import water from Greece and pursue relatively expensive investments in desalination and water reuse (EC, 2009, 2017). The estimated investment needs to reach full compliance with the UWWTD are EUR 826 million (EC, 2016b).

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. Water supply and sanitation: Projected investment needs to 2050 (million EUR)**

CYPRUS		Baseline 2015	2020	2030	Total by 2030	2040	2050
BAU water supply and sanitation	CAPEX	94	104	125	-	148	173
	TOTEX	230	236	252	-	270	289
Scenario Compliance + for water supply and sanitation	ADD. CAPEX	-	20	20	217	-	-
	ADD. TOTEX	-	44	41	469	-	-
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	1	1	11	-	-
	ADD. TOTEX	-	2	2	23	-	-
Compliance with UWWTD (sanitation)	ADD. CAPEX	-	18	19	206	-	-
	ADD. TOTEX	-	42	39	446	-	-

*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***

Cyprus has undertaken a preliminary assessment of the risk of flooding from all relevant sources (rivers, coastal waters, surface water flooding from heavy rainfall, dams, reservoirs and groundwater). The most significant types of flooding are due to rivers and surface water flooding from heavy rainfall (EC, 2015).

Cyprus has not experienced any severe floods from the sea in the past and is not expected to become particularly vulnerable to coastal flooding (EC, 2009).

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	
<b>Cyprus</b>	2,47	0,37	0,38	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, only 43% of natural surface water bodies achieve a good or high ecological status and 32% of heavily modified or artificial water bodies achieve a good or high ecological potential. Good chemical status is achieved for 74% of surface water, 75% of heavily modified or artificial water bodies and 55% of groundwater bodies. Only 20% of groundwater bodies are in good quantitative status (EC, 2017).

The major water management issue in Cyprus is over-abstraction of groundwater. For surface water, diffuse pollution is the main pressure (EC, 2017).

## **Past financing strategies and room for manoeuvre to finance future needs**

### ***Water supply and sanitation***

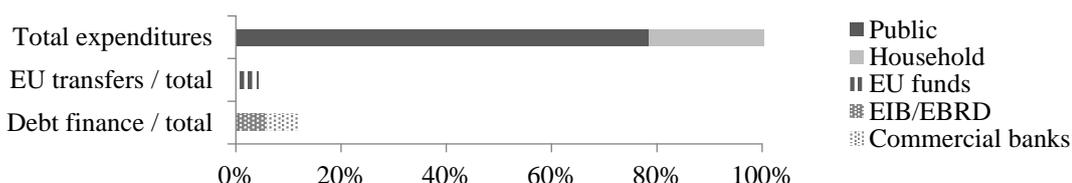
Cyprus has been gradually developing Master Plans to address the problem for freshwater shortage. This includes investment in water infrastructure, development of non-conventional sources of supply (water reuse, desalination) and demand management measures (EC, 2009).

Cyprus has recently put in place a new water pricing policy which applies to all water services. The new Regulations (128/2014) transpose certain requirements under the Water Framework Directive Art.9, with the application of a tariff that reflects the environmental and resource cost (ERC) for all water uses. The regulations include provision for the full cost recovery of domestic water service. The new domestic water tariffs approved by the Council of Ministers in Dec.2016 (Regulations 48/2017) move towards the full cost recovery of the domestic water supplied from the Governmental Water Works to the Local Water Authorities as well as for the application of the new ERC price for the abstraction of domestic water from other resources. Consequently, the Local Water Authorities revised their water tariffs for the supply of domestic water to the final consumers (households and other users) in order to achieve full cost recovery of water.

The EIB has provided finance for investments in water supply in Cyprus. For example, in 2016, a EUR 40 million loan was provided to build a water pipeline to link the Vasilikos desalination plant to the greater Nicosia region (EIB, 2016).

As depicted in Figure 1, Cyprus has been relying significantly more on public than household expenditures to finance WSS-related capital and operational expenses. The role of EU transfers has been very limited. The provision of debt by European multilateral banks and commercial banks highlights trust in the financial sustainability of at least some projects.

**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 Investment Bank, IJ Global, Thomson Reuters, Dealogic (for debt finance).

Table 4 indicates that Cyprus faces financing challenges, in particular due to affordability concerns. The country has very limited leeway to increase public spending due in particular to an already very high consolidated public debt. Further, the perceived depth of domestic banking relates to the international exposure of Cyprus' financial system, rather than to the availability of commercial debt for domestic infrastructure financing.

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

	Indicator	Value (rank)	Year	Data Source
<b>Ability to price water</b>	Water expenditures in lowest household income decile	0.71% (3/26)	2011-15	Authors based on EUROSTAT
	Full cost recovery equivalent in lowest household income decile	3.27% (17/28)	2011-15	Authors based on EUROSTAT
	At-risk-of-poverty rate	16.1% (12/28)	2016	<a href="#">EUROSTAT</a>
<b>Ability to raise public spending</b>	Tax revenue / GDP	33.6% (7/28)	2016	<a href="#">EUROSTAT</a>
	Government consolidated debt / GDP	107.1% (25/28)	2016	<a href="#">EUROSTAT</a>
	Sovereign rating	BB+	2017	<a href="#">Standard &amp; Poor's</a>
<b>Ability to attract private finance</b>	Domestic credit to private sector / GDP	248% (1/28)	2015	<a href="#">World Bank</a>

### ***Flood risk management***

Coastal defence in Cyprus is focussed on controlling erosion. In 2008, Cyprus spent EUR 0.8 million to protect coastal zones against flooding and erosion. Of this, an estimated EUR 0.45 million was spent on implementing the Master Plan to combat coastal erosion and EUR 0.35 was spent on monitoring costs (EC, 2009).

The EIB has provided finance for investments in flood defence in Cyprus. For example, in 2016, EUR 15 million of financing was provided for anti-flooding infrastructure investments in Larnaca (EIB, 2016).

## References

- European Investment Bank (EIB) (2016), “EIB provides funding to improve Nicosia’s drinking water supply and extends anti-flooding infrastructure financing for Cyprus”, <http://www.eib.org/infocentre/press/releases/all/2016/2016-244-eib-provides-funding-to-improve-nicosias-drinking-water-supply-and-extends-anti-flooding-infrastructure-financing-for-cyprus.htm> , (accessed: 4 April 2018).
- European Commission (EC) (2017), “The EU Environmental Implementation Review”, 28 Country reports, [http://ec.europa.eu/environment/eir/index\\_en.htm](http://ec.europa.eu/environment/eir/index_en.htm) .
- EC (2016a), “Synthesis Report on the Quality of Drinking Water in the Union examining Member States’ reports for the 2011-2013 period, foreseen under Article 13(5) of Directive 98/83/EC”, COM (2016) 666 final, <http://ec.europa.eu/environment/water/water-drink/pdf/reports/EN.pdf> (accessed 22 October 2018).
- EC (2016b), Eighth Report on the Implementation Status and the Programmes for Implementation (as required by Article 17) of Council Directive 91/271/EEC concerning urban waste water treatment (COM (2016)105 final) and Commission Staff Working Document accompanying the report (SWD(2016)45 final).
- EC (2015), “Report on the progress in implementation of the Floods Directive”, Commission Staff Working Document, SWD(2015) 51 final, Brussels, 9.3.2015.
- EC (2009), “Cyprus: Country overview and assessment of climate change adaptation” *The economics of climate change adaptation in EU coastal areas*, [https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/body/cyprus\\_climate\\_change\\_en.pdf](https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/body/cyprus_climate_change_en.pdf) (accessed: 4 April 2018).
- Neocleous, N. (2017), “Cyprus Experience with Urban Wastewater Treatment Directive”, presentation, 18-19 September 2017, Sofia, Bulgaria, [www.moa.gov.cy/moa/wdd/wdd.nsf/All/8D971A1A56867FFEC22581B4002ED7E2/\\$file/Cyp\\_waste\\_water.pdf](http://www.moa.gov.cy/moa/wdd/wdd.nsf/All/8D971A1A56867FFEC22581B4002ED7E2/$file/Cyp_waste_water.pdf) (accessed 11 May 2018).