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Europe's water in figures

An overview of the European drinking water and waste water sectors

2017 edition

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The European Federation of National Associations of Water Services

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Introduction

EurEau is pleased to present our data survey, covering both drinking and waste water services in Europe. This edition updates the first survey, which was carried out in 2009.

A lot has changed in the intervening eight years; technology is improving, innovation is increasing and consumers are demanding more environmentally sound and cost effective services.

We believe that our survey is the most comprehensive currently available. It includes national technical, economic and managerial data ranging from population connection rates to drinking water supply to waste water treatment levels to prices and governance. The results testify the diversity of the sector. They also show some of the immediate challenges our sector is facing, particularly regarding investment needs.

Water is essential for life. With this publication, we demonstrate the transparency of the sector that provides clean, safe and healthy drinking water to 95% of people living in Europe and ensures that waste water is returned to nature in a way that preserves our environment.

What appears to be a simple day-to-day service is in reality the result of complex processes and advanced technologies. Each solution is adapted to the specific local circumstances. They depend on factors such as population density, the type and available quantity of water resources, required treatment levels, local topography and many other elements. Additional factors influencing prices, costs and asset values include the scope of the service, salary levels, taxes and the facility running costs.

Therefore, we would like to issue a word of caution. These very different national circumstances do not allow for simple comparisons between countries. Substantial differences can also occur within countries, depending on the local conditions. The national average value can - of course - not show the range of individual results.

With this in mind, each graph is preceded by a short note explaining the reasons for the differences in national results.

You will quickly realise that not all countries have provided data. In many cases we could extrapolate the results across Europe. A small number of graphs reflect the situation in less than half of our member countries. The main reason for these data gaps lies in the diversity of national figures which are sometimes not comparable. In other cases, specific data are simply not collected in certain countries.

We hope you will find the information contained in this report useful.

Bruno Tisserand
EurEau President

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Table of contents

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1. Working hypothesis

The presented data were collected from our 29 member countries across Europe. See Table 1 below for a list of these.

Disclaimer: our members provided us with their own information or that from national official statistical services, making every effort to ensure their accuracy. While we are not responsible for any errors in the information we received, we acknowledge our accountability for the assembly, extrapolation and presentation of the figures in this report.

All data were not always available in each country and in order to evaluate the statistics at EurEau member level, data were extrapolated - according to the most relevant variable - to estimate the missing values. For each figure where an extrapolation is presented, the characteristics are described (variables and regression coefficient).

As every country collects data with different frequencies, there is no reference year where all the data are collected. However, statistics on the water sector do not vary as quickly as other sectors and we are confident that comparing data collected between 2012 and 2015 is still relevant.

For clarity in the figures, the country codes are used on the x-axis. Table 1 details the country codes. In this text, 'EU*' refers to EurEau members while the term 'EU' indicates the European Union.

Finally, when data are not available for a country, we indicate this by using N.A. By convention, the values lower than half of the first graduation are displayed on the figures.

Table 1: Country codes

CODE	COUNTRY
AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece

CODE	COUNTRY
ES	Spain
FI	Finland
FR	France
HU	Hungary
HR	Croatia
IE	Ireland
IT	Italy
LU	Luxembourg
MT	Malta
NL	The Netherlands

CODE	COUNTRY
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Serbia
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	The United Kingdom
EU*	EurEau members

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2. General information

2.1. Population connected to a network

Figure 1 presents the percentage of people connected to a drinking water network, a waste water network and a waste water treatment plant per country and the percentages for Europe.

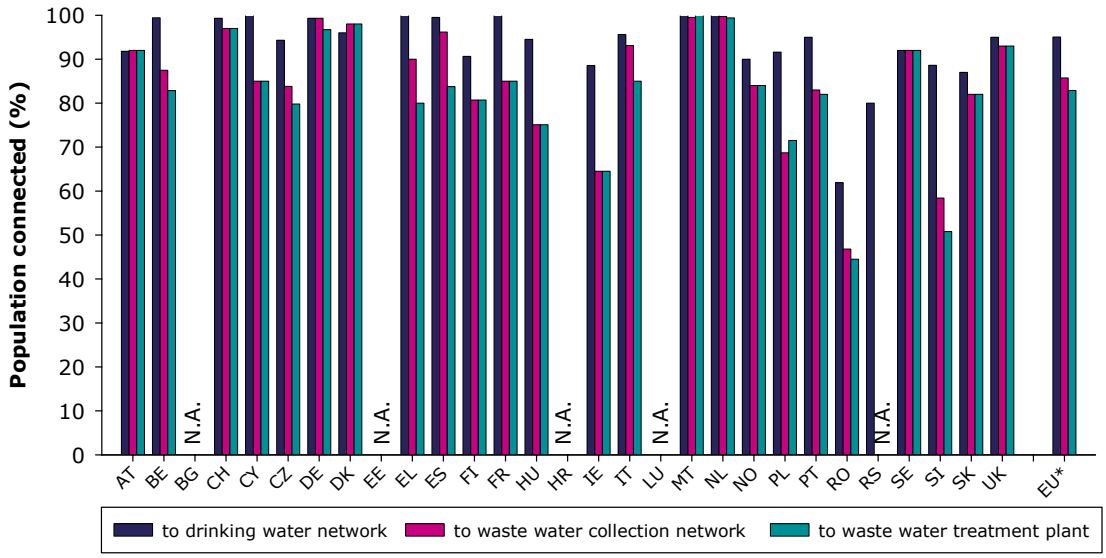

Figure 1: Population connected to a network

In this graph, the missing data for the extrapolation were taken from the previous statistical overview[1], assuming that the connection rates stayed constant during the intervening eight years. This extrapolation is a conservative estimate as the connection rate grew over time.

[1] EurEau Statistics Overview on Water and Wastewater in Europe 2008 (Edition 2009), June 2009, Brussels.

For EurEau member countries, the extrapolated population of 499 million people are connected to a drinking water network, while 450 million inhabitants are connected to a waste water collection network and 435 million people are connected to a waste water treatment plant. Note that the connection to a collection system and a waste water treatment plant presented in Figure 1 does not include those people connected to an individual sanitation system. Waste water collected this way is still treated before going into the environment, it is just not represented here.

2.2. Annual billing

Figure 2 presents the revenue collected through water bills, separated by type of service. When the information related to the type of services is not available, the total is displayed.

The extrapolation for the EU* was done with the average annual billing rate according to the total population of each country. The extrapolation was carried out for the total amount billed and not for each service, as the coverage of each type of service in the water bill is different for each country. The repartition per service expressed for the EU is then the raw available data which do not add up to the extrapolated value. Obviously, the overall billing largely depends on the number of inhabitants per country.

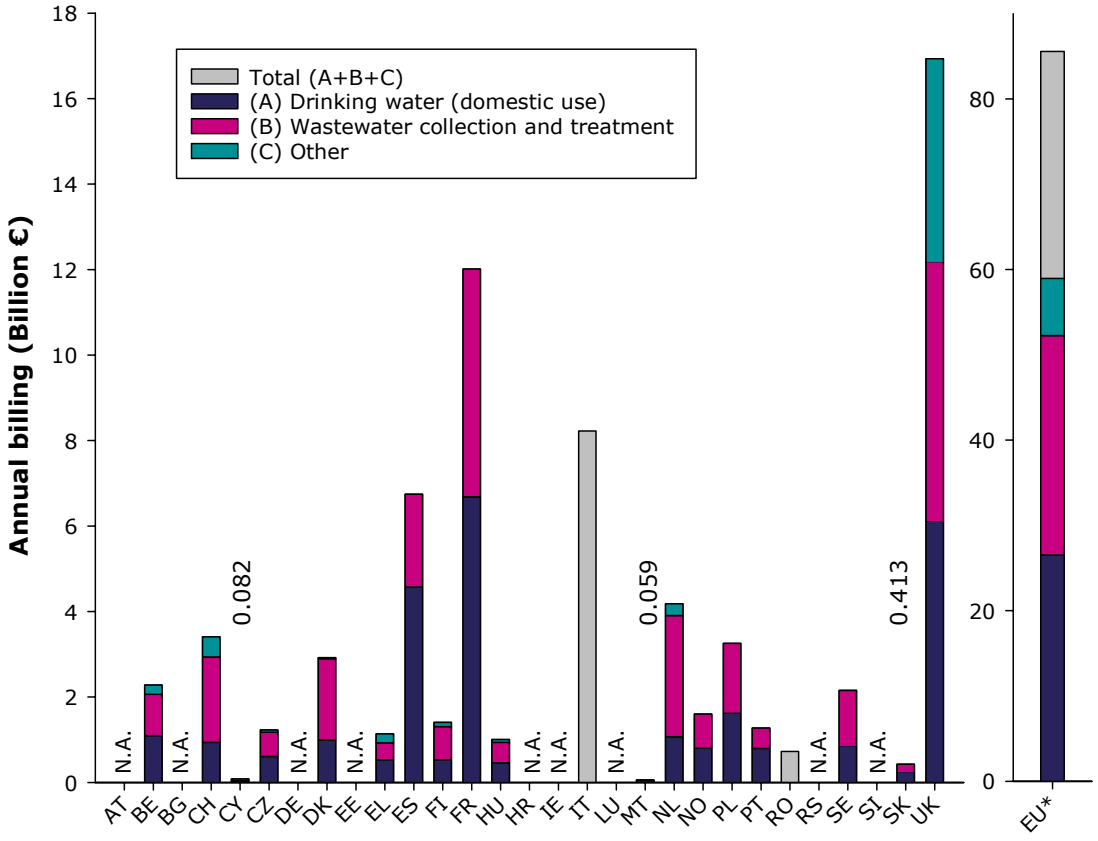

Figure 2: Annual amount of revenue collected from the different water services

2.3. Investment

Figure 3 presents the total amount of money invested in drinking and waste water infrastructures annually. The extrapolation is derived from the average investment rate according to the total country population.

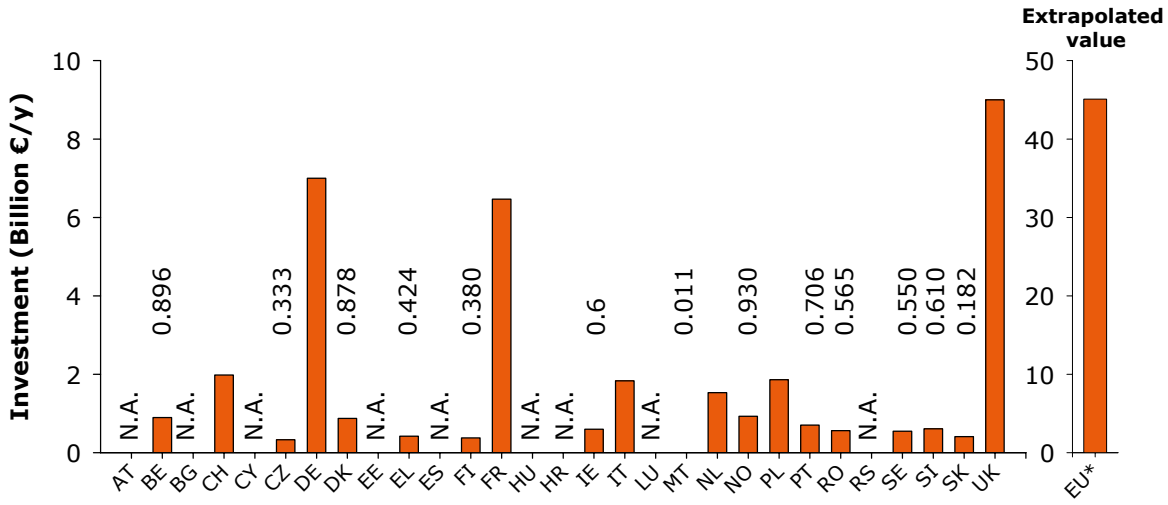

Figure 3: Total annual investment in both drinking water and waste water infrastructure

Annually, European water services invest approximately €45 billion in water infrastructure. This means that, on average, water services invest €93.5 per inhabitant per year (Figure 4). This investment is financed mainly through tariffs (water bill), taxes and transfers (from European Union financing schemes or loans from other countries). The investment rate depends on many factors including the investments necessary to comply with EU legislation, national upgrading requirements, the cost of manpower etc.

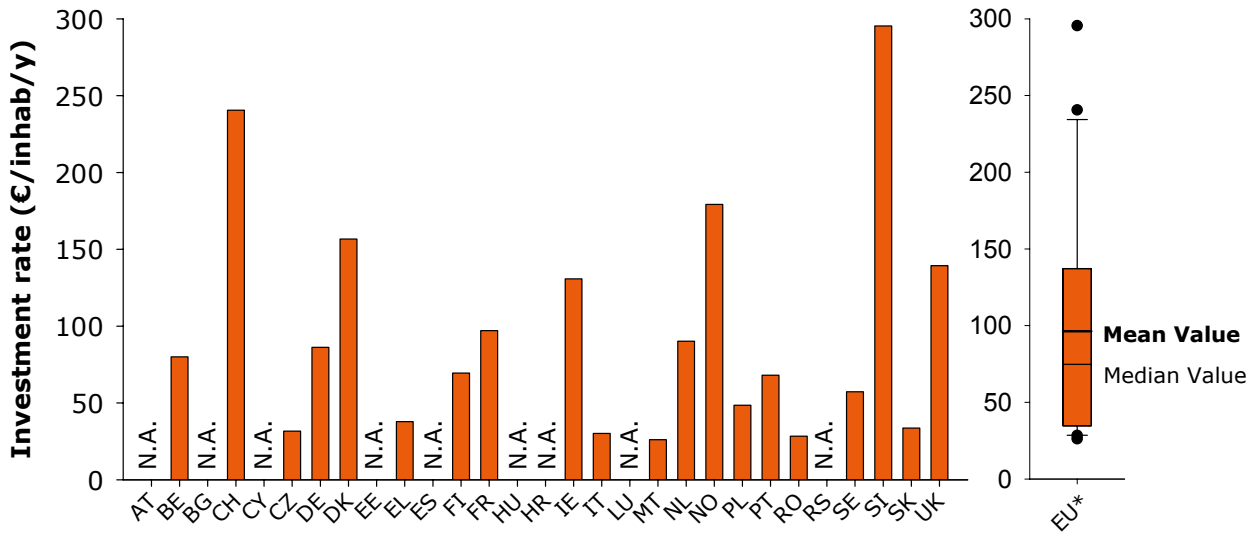

Figure 4: Annual investment rate by water service providers in both drinking water and waste water infrastructure

2.4. Employment

In this section we quantify the workforce employed by European water service providers. Figure 5 shows the direct and indirect employment in the sector, covering both drinking and waste water services. Direct employment comprises the people employed by water operators for the design, construction, maintenance, control and management of water services. The indirect employment is a rough estimation of the jobs generated in other sectors by water services. It can cover employment in subcontracted companies as well as the share of the employment related to the production and distribution of equipment and chemical products used in water services. This estimation is very variable and difficult to measure but it is presented as it is not negligible when talking about the impact of water services on employment in Europe.

As the numbers regarding indirect employment are not reliable, the extrapolation was done only for direct employment figures and is based on the average share of the total country population. Water services in Europe employ 476 000 full time equivalent (FTE) people, which represents 0.1% of our member countries' population.

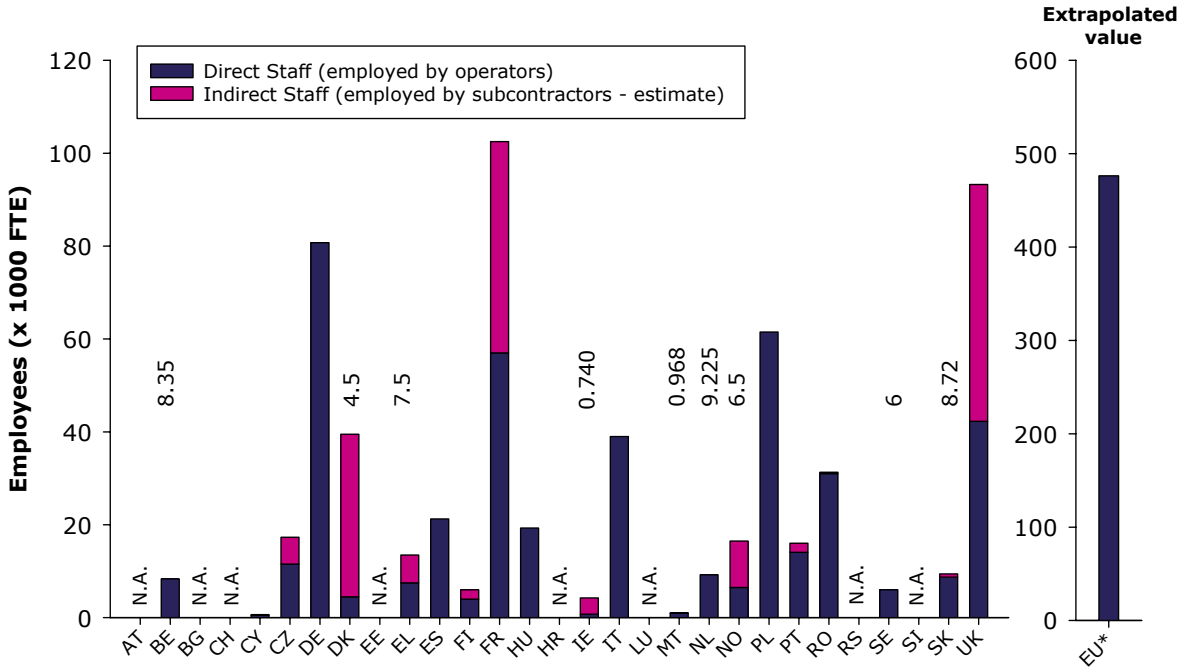

Figure 5: Direct and indirect employment generated by water services in EU countries*

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2.5. Management

Figure 6 and Figure 7 present the percentage of the population covered by the different types of drinking water and waste water management in European countries. The type of management is a competence of Member States which makes these figures vary a lot from one country to another.

For clarification, the definition of the management types are given below:

~ Local government department: the infrastructure and the service are owned and managed entirely by a public authority such as a municipality or a group of municipalities.

~ Publicly owned company: the infrastructure is publicly owned by the local authority and the service is delegated to a publicly owned company.

~ Private operator: the infrastructure is publicly owned by the local authority but the service is delegated to a private company.

~ Privatisation: the infrastructure and the service are owned and managed entirely by a private company, generally supervised by a public regulator.

~ Public-Private joint venture: the infrastructure and the service are owned and managed entirely by consortium made of public and private companies.

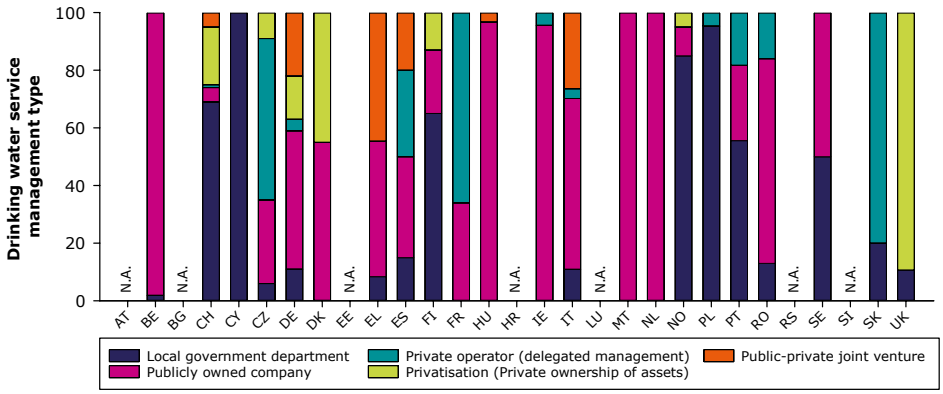

Figure 6: Percentage of the population served by drinking water services for different management types

Figure 7: Percentage of the population served by waste water services for different management types

2.5. Water tariffs

Water tariffing is a complex topic as they depend on multiple local parameters like tax level, water sources (groundwater usually requires less treatment than surface water), length of network per inhabitant, receiving water (sensitive areas require a higher level of treatment for waste water), etc. It is generally regulated through a public body; either an official regulator or the local government. Figure 8 and Figure 9 also present the averages at EurEau member level which might be composed of very different local prices. They are useful in evaluating the global diversity of prices across Europe but a direct comparison of water bills or the price per cubic metre between countries is not possible.

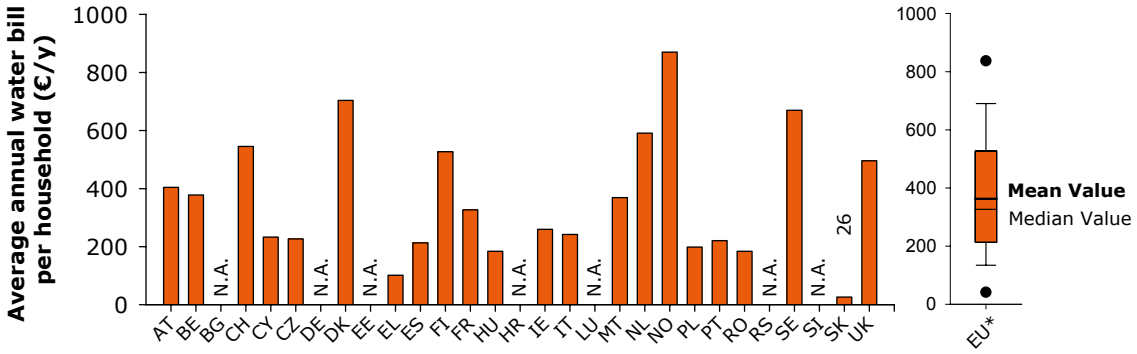

Figure 8: Average annual water bill per household (depending on the country, the figures provided are from between 2012 and 2015)[2]

[2] For Germany, see the VEWA–study: comparisons of water and waste water, 3rd edition, BDEW. The methodology used in this study is different and the numbers should not be compared to the one presented here

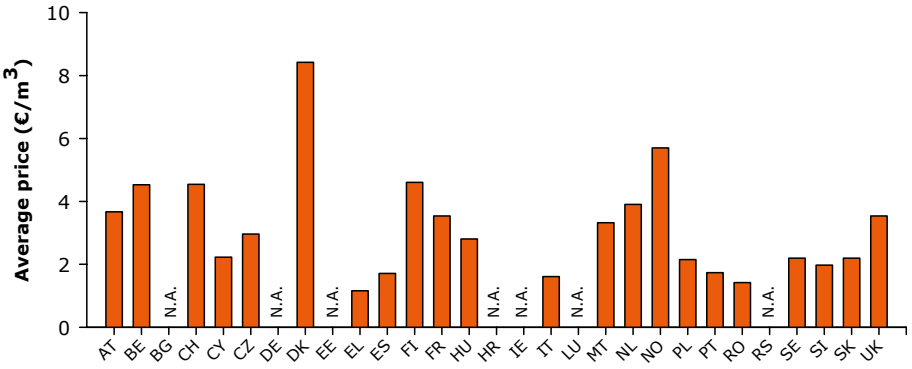

Figure 9: Average annual water bill per household (depending on the country, the figures provided are from between 2012 and 2015)[2]

3. Drinking water services

This section specifically covers statistics related to drinking water services.

3.1. Length of network

Figure 10 presents the total length of the drinking water pipe network per country. The data was extrapolated according to the population connected to a drinking water network with a coefficient of determination R2 of 0.834. As the missing countries were in the range of those with a shorter network, the total length of the drinking water pipe network in Europe is not very sensitive to this extrapolation. The total length of the drinking water network in Europe is 4 225 527 km, which is eleven times the distance from the Earth to the Moon. This infrastructure requires maintenance and investments to continue guaranteeing the level of service expected and provide clean and wholesome water for all.

Figure 11 presents the length of the drinking water network per connected inhabitant. It ranges from 4.92 m/inhabitant for Spain to 19.55 m/inhabitant for Finland. Such differences in the infrastructure are mainly due to population density.

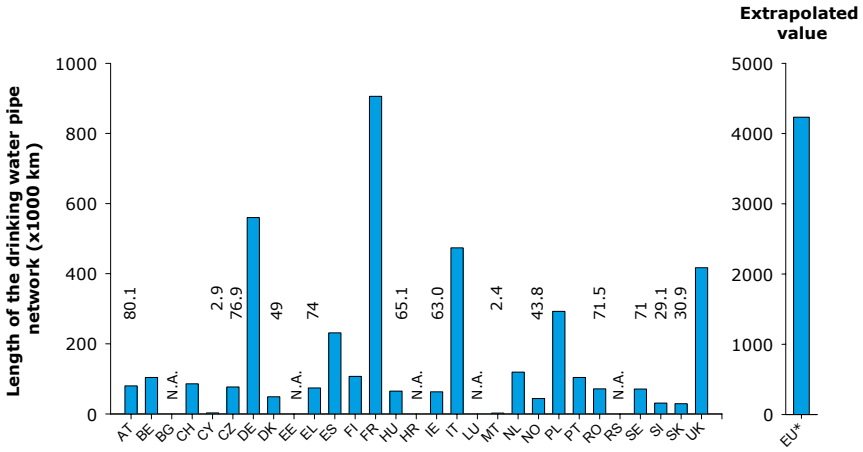

Figure 10: Length of the drinking water pipe network in Europe

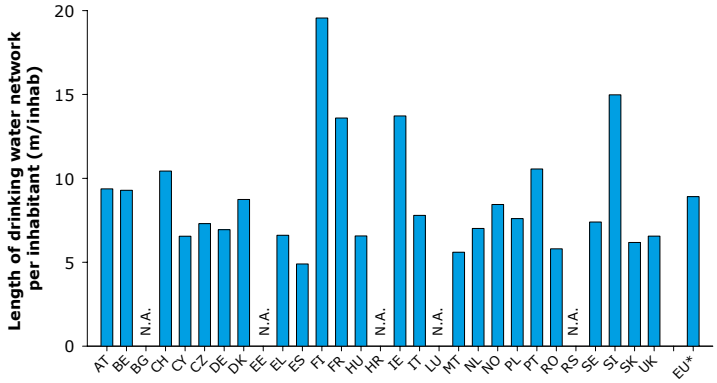

Figure 11: Length of the drinking water pipe network per connected inhabitant

3.2. Drinking water supply

Figure 12 presents the amount of water delivered by drinking water suppliers in millions of cubic metres per year. It covers both billed consumption and non-revenue water in Europe. Extrapolation at European level was made through the average water consumption/water supplied ratio, taking into account the average EU* water consumption for countries that did not provide data. The total volume of water supplied in the EU is 44.7 billion m³/year.

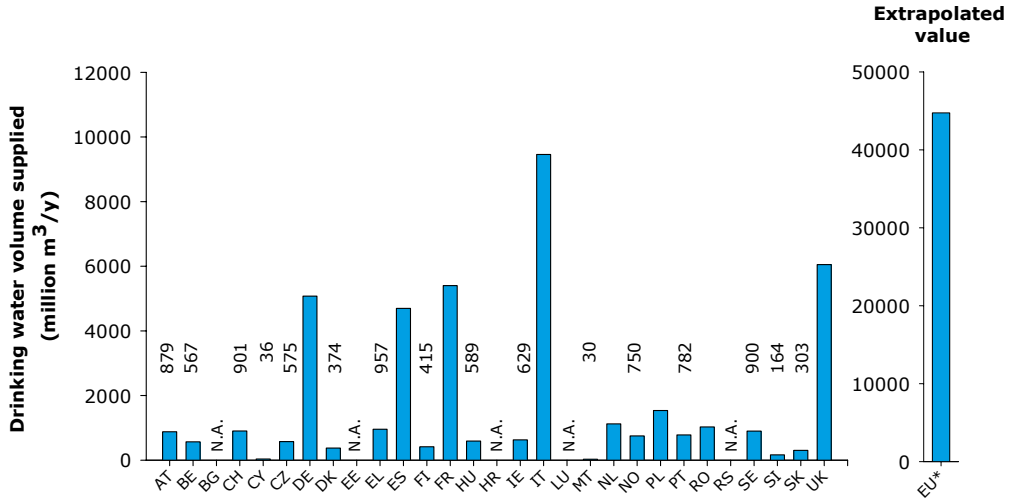

Figure 12: Drinking water supply

3.3. Drinking water sources

Figure 13 shows the water coming from different sources. We can see significant variation between countries. According to this figure, for EurEau members, there is more drinking water coming from surface water than from ground water. This percentage is based only on the countries that provided data as it is not possible to extrapolate for missing countries.

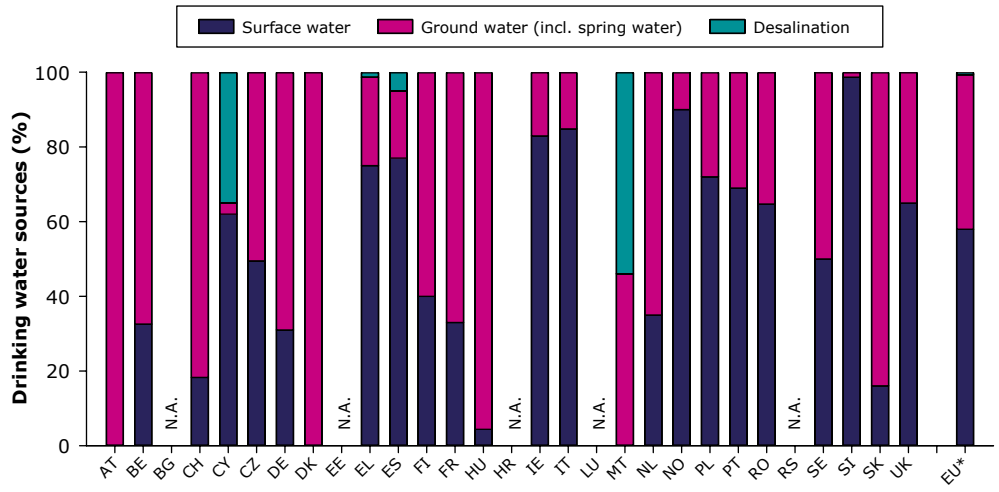

Figure 13: Sources of drinking water

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3.4. Drinking water consumption

Figure 14 presents the drinking water consumption that is billed to consumers. It does not only represent household consumption but may include commercial and industrial uses as presented in Figure 15. As the separation for each use is not always available in every country, it is not possible to compare Figure 14 and Figure 15. The extrapolation of the total consumption results in the sum of extrapolated values for each use. For drinking water consumption in households, the data are easily available and was made according to the population connected to a drinking water network with a coefficient of determination R2 of 0.9767. Water consumption figures for commercial and industrial use were not always available, especially for countries where a lot of water is consumed. Therefore, we estimated based on the population connected to the drinking water network. Overall, drinking water consumed in households is 22.8 billion m^3/year and the total billed consumption is 31.8 billion m^3/year.

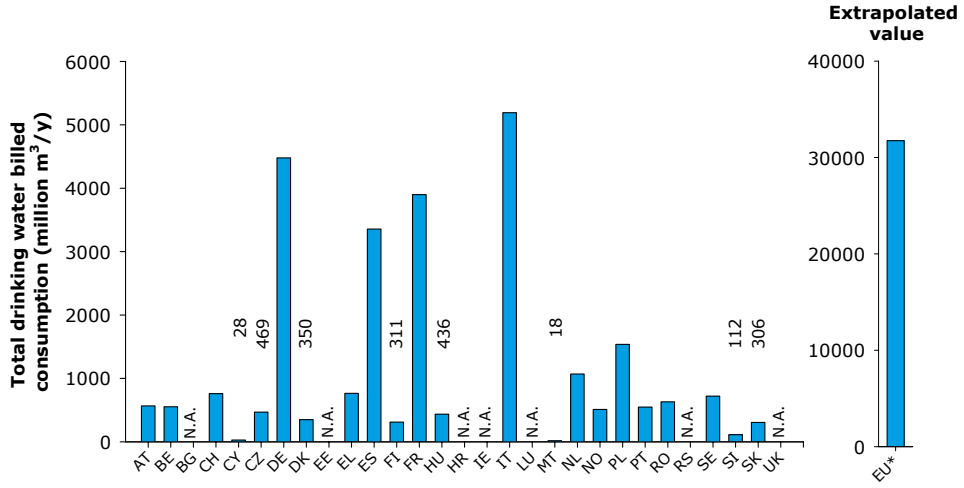

Figure 14: Drinking water billed consumption

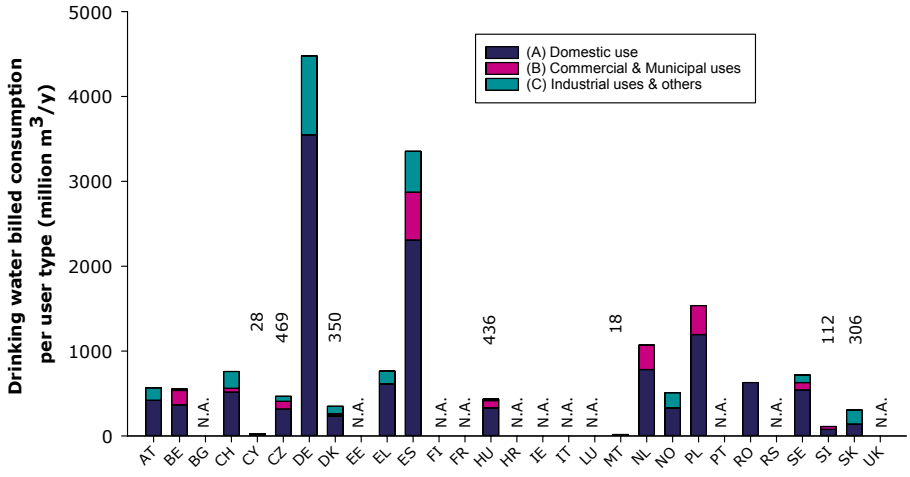

Figure 15: Drinking water billed consumption presented per user type: domestic, commercial and municipal, and industrial

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3.5. Residential drinking water consumption

The residential drinking water consumption is a statistical estimation provided by our members and is often available at national level. It might be different from the consumption presented in the previous section because of statistical definitions and treatments done at national level. For these reasons, the values at European level are computed based on averages of the data available and no extrapolation was done.

The average consumption for our member countries is 128 litres per inhabitant per day. The average household composition is 2.3 inhabitants and the average consumption per household is 111m^3/household/year.

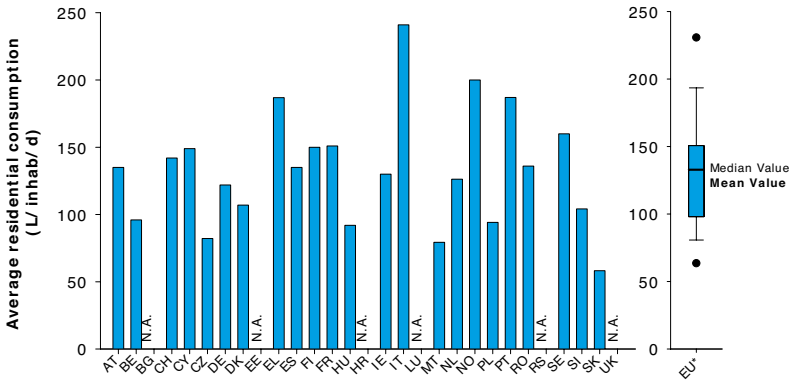

Figure 16: Average daily consumption per person

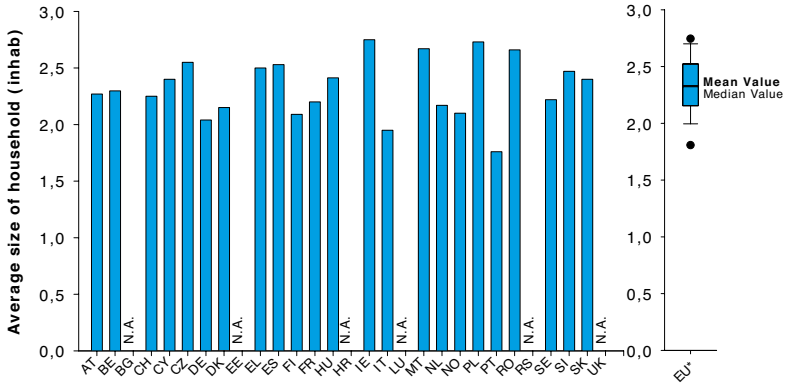

Figure 17: Average household size in Europe

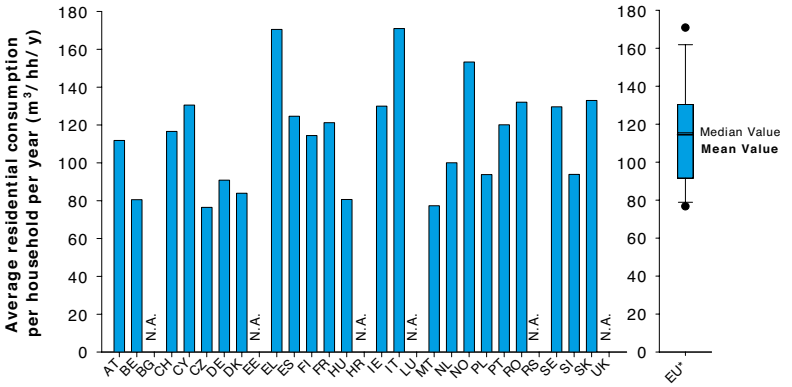

Figure 18: Average residential consumption per household per year

3.6. Distribution losses

Figure 19 and Figure 20 present the distribution losses for drinking water networks in Europe using the two units most commonly used by professionals: percentage and volume per km of pipe. The losses cover all non-revenue water which might include water used for institutions, maintenance, street-cleaning, fire-fighting, etc. The losses have a meaning in the local context when the management of the network, the origin of the losses and age of the network are known. Mean values at national level are already aggregated from local level data. It is not possible to make comparisons between countries in this context.

The mean values for losses are 23% and 2171 m³/km/y in EurEau member countries.

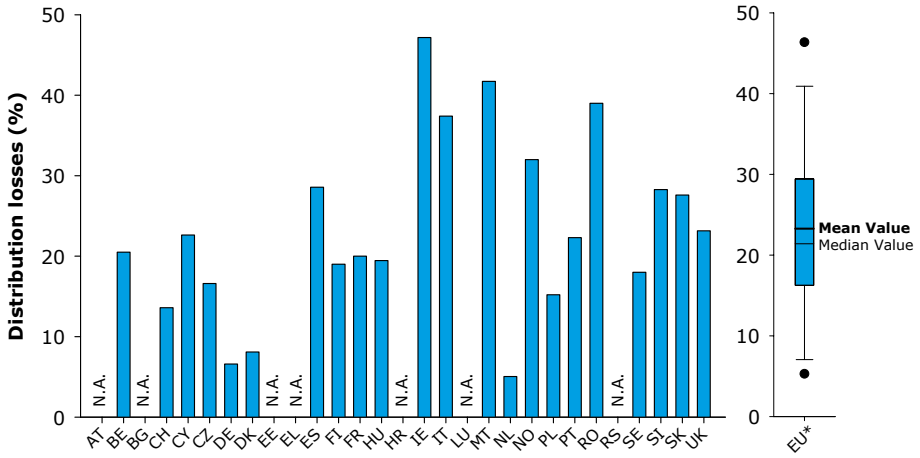

Figure 19: Average distribution losses in percentages

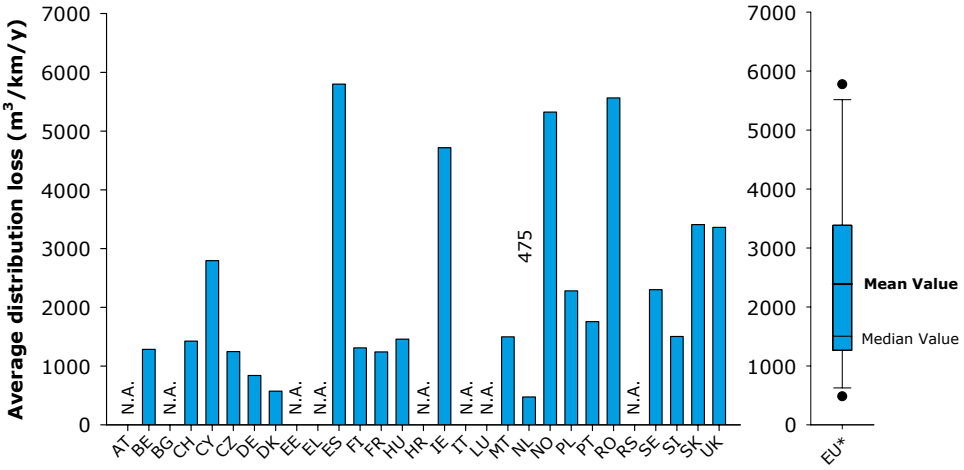

Figure 20: Average distribution losses in m³/km/y

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3.7. Asset renewal rate

This section presents the renewal rates for the different countries. The numbers vary a lot from one country to another depending on the local water management system, the age of the infrastructure, the impact of depreciation and/or the origin of the drinking water. It was also not possible to have figures for the same year so those shown here are from 2012 to 2015. Depending on the available (EU) funds, these numbers can change from one year to another.

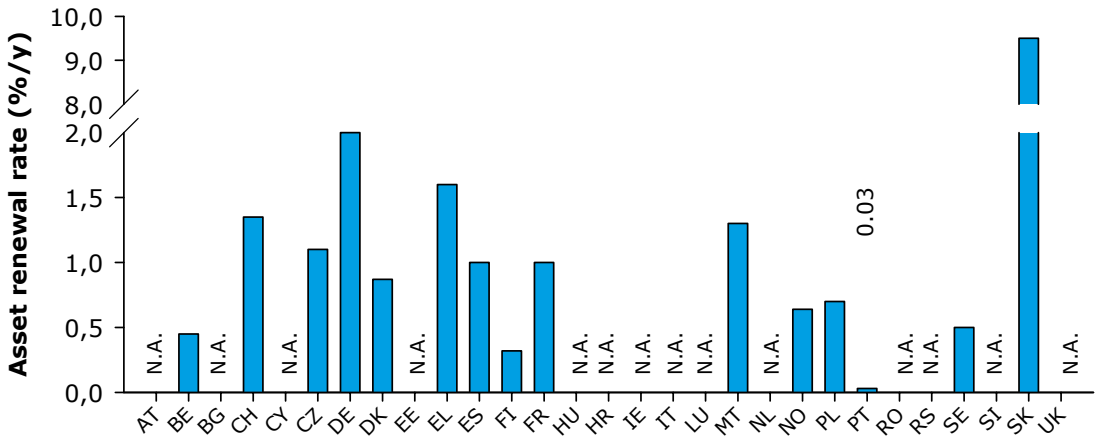

Figure 21: Asset renewal rate for drinking water infrastructure (data from 2012 to 2015 depending on the country)

4. Waste water services

This section specifically covers statistics related to waste water services.

4.1. Sewer network

Figure 22 presents the length of the sewer network per connected inhabitant. Few countries collect data on the proportion of combined and separate sewers so the collected data represents the aggregated value for all types of sewers. The mean value is 7.3 m of sewers per inhabitant connected in EurEau member countries. The total length of sewer network for the EU* was extrapolated according to the population connected to a sewer network (R2=0.85). It covers 3 million km, which represents almost eight times the distance between the Earth and the Moon.

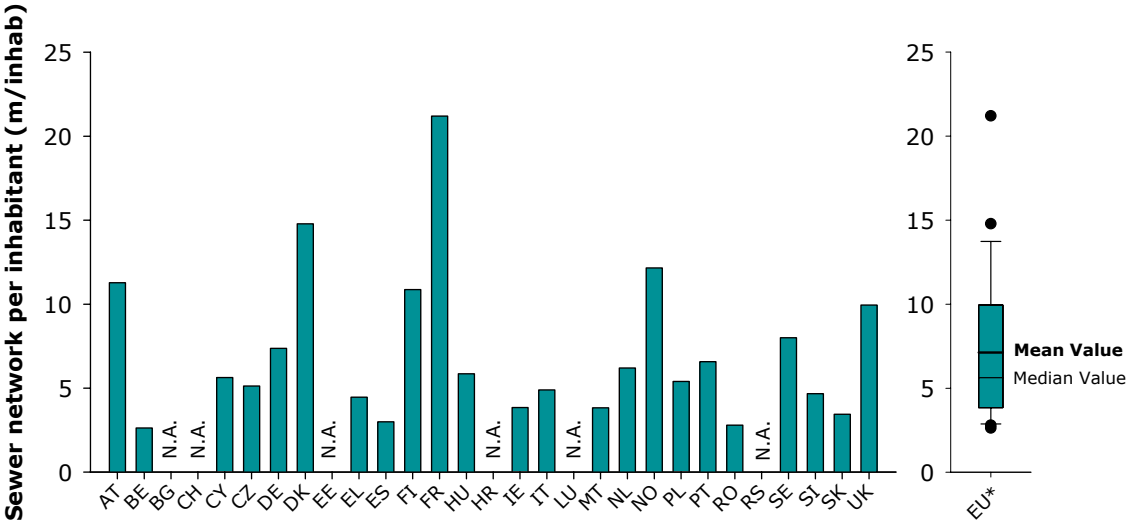

Figure 22: Length of the sewer network per inhabitant connected

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4.2. Waste water treatment

The waste water treatment capacity is the total load that a waste water treatment plant is able to treat according to the definition of population equivalent described in the Urban Waste Water Treatment Directive (91/271/EEC (UWWTD)). The total treatment capacity in the EU has to be bigger than the actual population in order to anticipate the changes occurring over the life time of the waste water treatment plants and to take into account the industrial pollution load if they are authorised by local authorities. The extrapolation of the waste water treatment capacity for the missing values was done according to the population connected to a waste water treatment plant with a coefficient of determination R2 of 0.975.

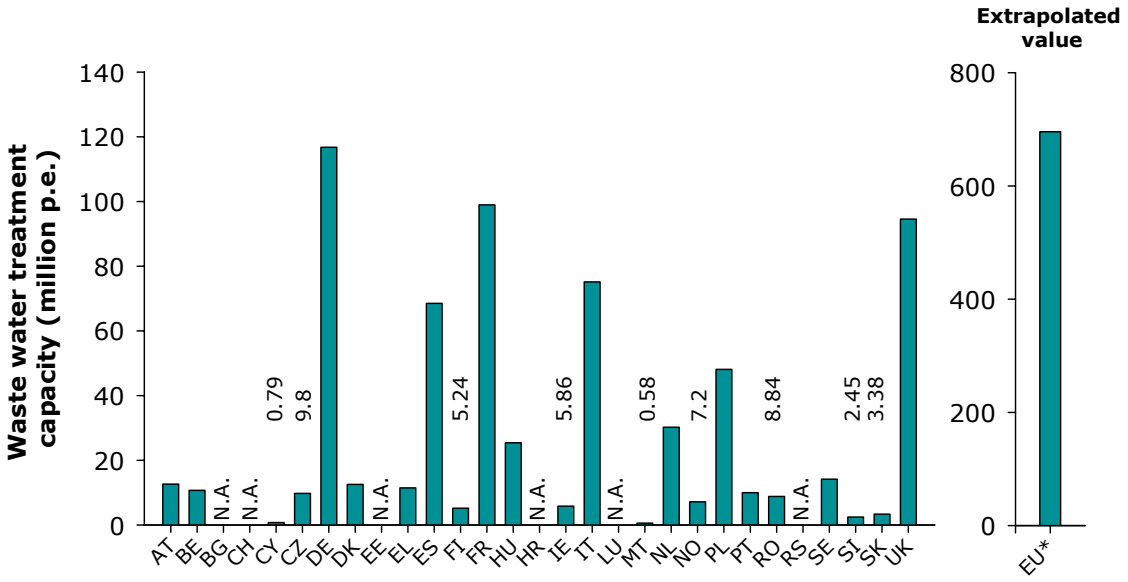

Figure 23: Waste water treatment capacity in population equivalent

Figure 24 presents the percentage of the pollution load treated by waste water treatment plants depending on their level of treatment defined in the UWWTD. Tertiary treatment level is not defined in the directive but is often used by professionals for "more stringent treatment than secondary treatment". It can cover nutrient removal but also disinfection. The data presented for the EU* only considers the countries that answered. No extrapolation was possible in this case as the level of treatment depends on the sensitivity of the receiving waters according to the UWWTD. In Europe, 3.1% of the load is treated at primary level, 28.5% at secondary level and 68.4% at tertiary level.

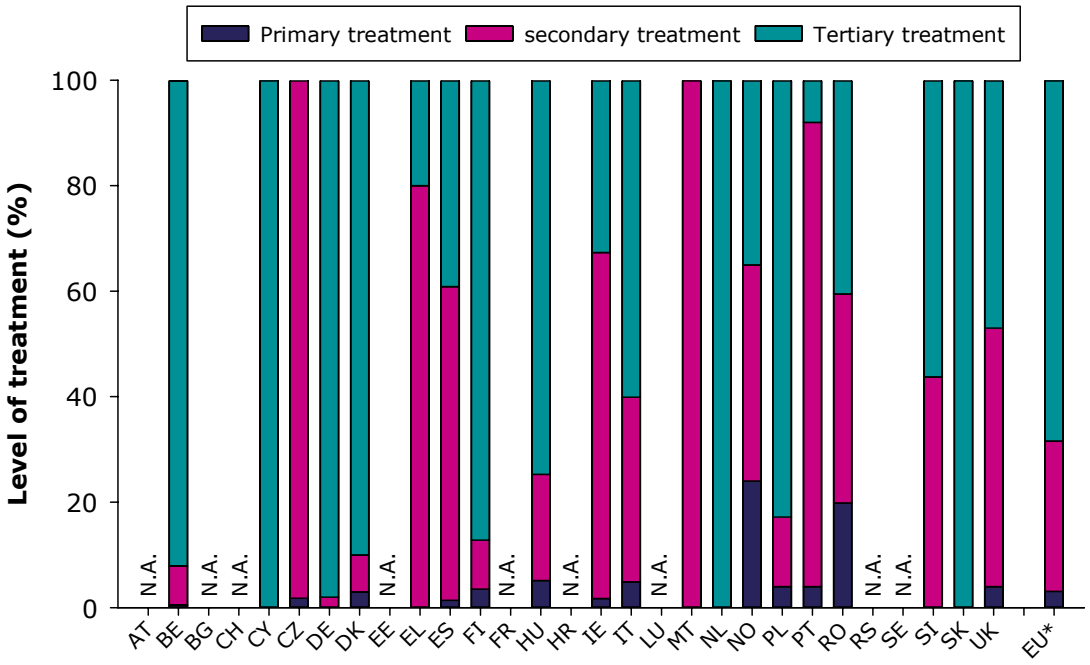

Figure 24: Level of treatment in percentage of load entering waste water treatment plants

4.3. Sewage sludge

Figure 25 presents the destination of sewage sludge produced per country with the figures for the EU*. As extrapolation is not possible for the missing countries, the figures for EU* do not include those from Austria, Bulgaria, Croatia, Denmark, Ireland, Serbia and Switzerland. Data from 2013-2015 were used, depending on the country.

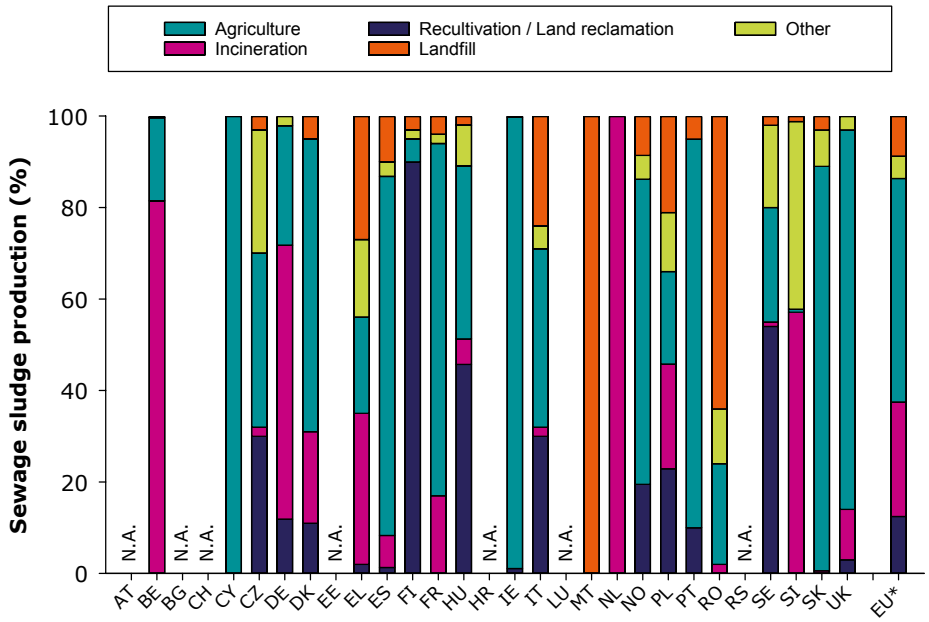

Figure 25: Destination of the sewage sludge production

Figure 26 presents the results only for the EU* (last column of Figure 25) and was obtained by summing the total weight of sewage sludge over the responding countries according to the final destination.

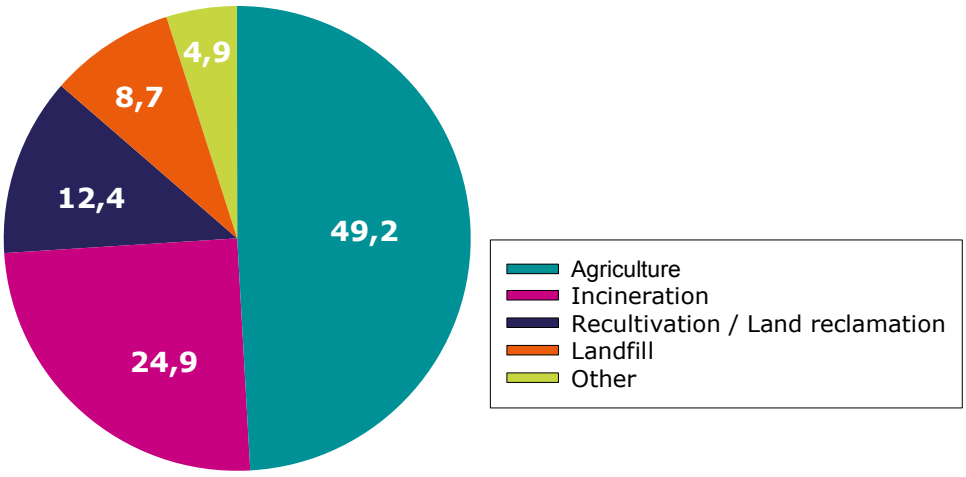

Figure 26: Destination of sewage sludge produced in EurEau member countries (excluding AU, BG, HR, DK, IE, RS and CH)

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4.4. Asset renewal rate

This section presents the renewal rates for the different countries. The numbers vary a lot from one country to another according to the local water management system, the age of the infrastructure, the impact of depreciation and/or the level of requirements. For the countries that submitted data, it was not possible to have numbers for the same year so we have a range of information from between 2012 to 2015. Depending on the available funds, these numbers can change from one year to another.

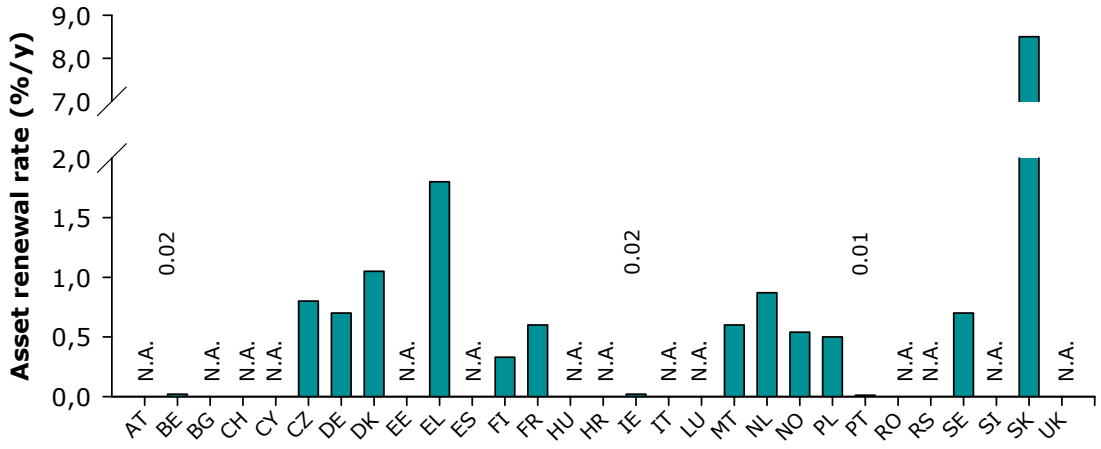

Figure 27: Asset renewal rate for waste water infrastructure (data from 2012 to 2015 depending on the country)

About EurEau

EurEau is the voice of Europe's water sector. We represent drinking and waste water service providers from 29 countries in Europe, from both the private and the public sectors. Our members are the national associations of water services in Europe.

At EurEau, we bring national water professionals together to agree European water industry positions regarding the management of water quality, resource efficiency and access to water for Europe's citizens and businesses. The EurEau secretariat is based in Brussels, from where we coordinate the work of around 200 experts from member organisations and utilities and advocate common positions with EU decision makers.

Our members are fully committed to the continuous supply of clean water and its safe return into the water cycle. We have a role in raising awareness of threats to the water environment. With a direct employment of around 500,000 people, the European water sector makes a significant contribution to the European economy.

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