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Robert Schuman Centre for Advanced Studies
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Water services in selected Central and Eastern
European countries

Michael Klien and Maria Salvetti

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Abstract

Water services in Central and Eastern European countries have experienced important transformation processes since the 90s. After a first wave of wholesale reforms of the economic systems after the collapse of the Soviet Union (decentralization and private sector involvement), more recent reforms try to address specific water-related challenges which many countries in the region encounter on their way to EU accession. To tackle issues like rising tariffs, low quality and performance, limited access and insufficient infrastructure maintenance, the creation of dedicated regulatory bodies as well as aggregation reforms have been two key reform approaches.

Keywords

Central and Eastern Europe, water, aggregation, regulator, EU accession.

1. Introduction

A crucial component to understand the current challenges in the water and sanitation sector (WSS) in Central and Eastern Europe (CEE) is the breakdown of the Soviet Union and Communism in the late 1980s, which represents the starting point for a number of important transformation processes.¹ Of particular relevance here is that these events triggered a wave of decentralization reforms, affecting virtually all countries in the region. Due to the decentralization reforms during the 90s the number of municipalities increased sharply in most CEE countries. These decentralization reforms also affected water provision: apart from infrastructure ownership, which in many cases was transferred to the local level, also the service provision was shifted from national and regional levels to the local government.

At the same time, and following the collapse of the socialist system, the overall economy in many CEE countries was reorganized from a state-centered approach towards more private sector involvement. Albeit in most cases to a lower extent as well as with large differences across countries, also the water sector of the region experienced an increase in private sector participation after 1990.

It is important to bear in mind that these transformation processes were not targeted specifically towards the WWS, and impacted the regional water sector along with many other areas of public service provision as well as the overall economy. Consequently, a number of reforms specific to the water sector ensued, in some cases (partially) reversing the initial reactions after the collapse of the Soviet Union. The current trend of regional aggregation reforms can be interpreted as a (partial) reversal of the initial decentralization reforms. On top of that, since the initial reforms were not designed to address the specific problems of the water sector, despite some progress many deficiencies which were already present in the 1990s -- such as access in rural areas -- are still present today.

The situation in most CEE countries in 1990 can be characterized as a so-called low-level-equilibrium:² Water provision was characterized by low quality in the sense of high intermittency rates, reduced service continuity and low treatment standards coupled with low tariffs and costs. In many cases there was no or limited metering or the associated tariffs were much too low for any significant cost recovery (see Maslyukivska et al., 2003; World Bank 2015). Due to the lack of financial resources, the infrastructure was poorly maintained, further adding to the low quality of the service. At the same time, customers were unwilling to accept increased tariffs for a low quality service. This vicious circle constitutes the low-level equilibrium of the WSS in CEE countries in the early 1990s.

The EU accession, and particularly the adoption of the *acquis communautaire* in the form of the Water Framework Directive (WFD³), the Drinking Water Directive (DWD⁴), as well as the Urban Wastewater Directive (UWWTD⁵) can be considered a push out of this low-level equilibrium because compliance with EU regulations requires higher quality through specified minimum quality standards. At the same time, it was clear that this higher quality would require investments and therefore at least to some extent higher tariffs. While some of these adaptation costs, particularly on the investment side, would be compensated through targeted EU-funding, improvement of the revenue base is crucial. This

¹ In this chapter we use CEE to refer to the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Kosovo, FYR Macedonia, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, Ukraine. While not all countries in CEE were part of the Soviet Union or the Eastern Block, e.g. socialist Yugoslavia and its successor states, the close political and economic integration had strong effects on all countries in the region.

² See Savedoff and Spiller, 1997, for an in depth presentation of the concept of low-level equilibria in the water sector.

³ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

⁴ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption

⁵ Council Directive 91/271/EEC concerning urban waste water treatment

explains why EU accession has to be understood as a main influencing factor in the water sector in Central and Eastern Europe.

To face the challenge of rising tariff pressure to improve service quality, access and infrastructure maintenance, two overarching trends have emerged in the CEE countries over the last 2 decades: On the one hand, the use of dedicated regulatory bodies to monitor and incentivize water utilities has become a frequent phenomenon in the region. On the other hand, and with a focus to overcome possible disadvantages from territorial fragmentation on efficiency and performance of water utilities, a number of countries have embarked on aggregation reforms. Although the primary goal of such reforms is not necessarily economic (see World Bank, 2017), the typical expectation was to reap cost savings through economies of scale.

The structure of this chapter is the following: The next section will sketch the main challenges for the water sector in CEE countries. In particular the questions of service quality, access but also affordability play a key role in this analysis. In section 3, the role of EU accession for governance and regulatory policies are discussed, followed by a presentation of the two main reform trends in the regions WSS: aggregations and regulatory bodies. Section 4 outlines the role of private sector participation, before section 5 briefly discusses the WSS performance across CEEC countries. Section 6 concludes.

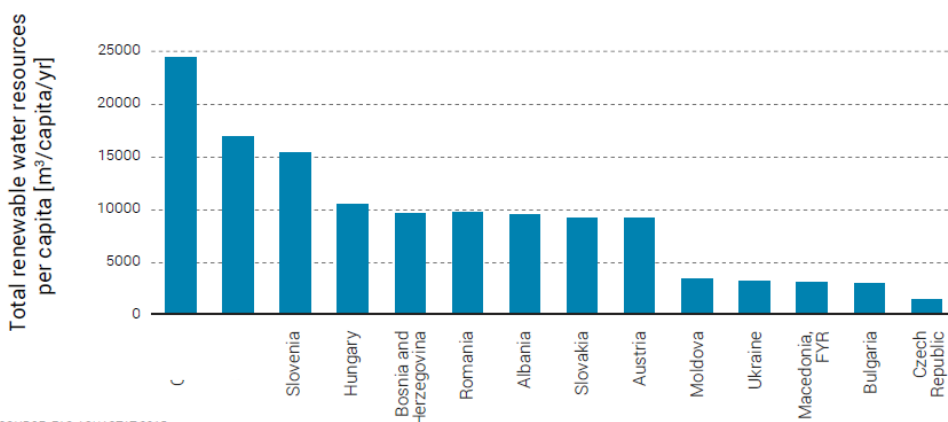
2. Challenges for the water sector in CEE countries

In 2015, the Danube Water Program from the World Bank produced a report analyzing the state of the water sector in 16 countries of the Danube River Basin (World Bank, 2015). The information and data used to describe the challenges of the water sector in Central and Eastern European countries are taken from this report.

2.1 Water Resources and Provision

The Danube river basin which spans over 801,463 km² and encompasses 19 countries including all 16 Central and Eastern European countries. The area is rich with renewable water resources but there are important differences between countries with Croatia enjoying more than 24,000 m³ per capita per year while Czech Republic experiences water stress with 1,250 m³ per capita per year (water stress accounting for less than 1,700 m³ per capita per year, according to Falkenmark indicator) (Figure 1).

Figure 1: Renewable freshwater resources per capita per Danube River Basin country



SOURCE: FAO AQUASTAT 2015.

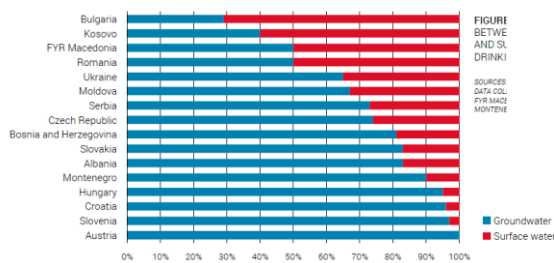
NOTE: DATA FOR KOSOVO AND MONTENEGRO UNAVAILABLE

Source: State of the Sector report (World Bank, 2015)

The effects of climate change in the region induces more frequent droughts and floods, as well as more frequent extreme rainfalls. These phenomena are expected to impact WSS services through water quantitative shortages and quality issues, or damages to residential and industrial WSS infrastructure. Groundwater is the main source for water supply in Central and Eastern European countries as 70% of drinking water is produced from groundwater (

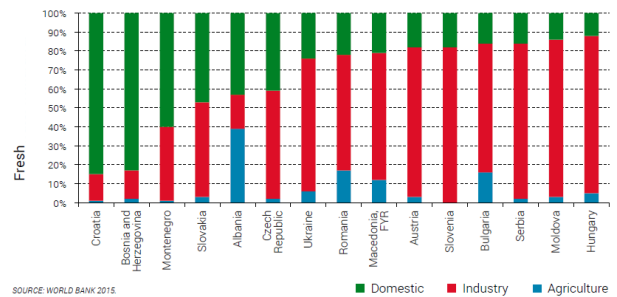
Figure 2). However the share of surface water in drinking water production varies a lot across countries and can represent up to 70% in Bulgaria for instance. Industrial and domestic uses are predominant with agriculture representing from 0 to 40% of total water consumption (between groundwater and surface Figure 3). However, due to the increase in metering level and in tariffs, and the decrease in industrial activities throughout the region, the water consumption per capita dropped over the past 15 years, reaching an average of 122 liters per capita per day in 2012, and 113 liters per capita per day for CEE EU Member States. The quality of drinking water is rather high in the region with an average of 93% of samples tested in full compliance with quality standards, and 96% for CEE EU Member States.

Figure 2: Ratio between groundwater and surface water as drinking water source



Source: State of the Sector report (World Bank, 2015)

Figure 3: Freshwater withdrawal distribution per usage



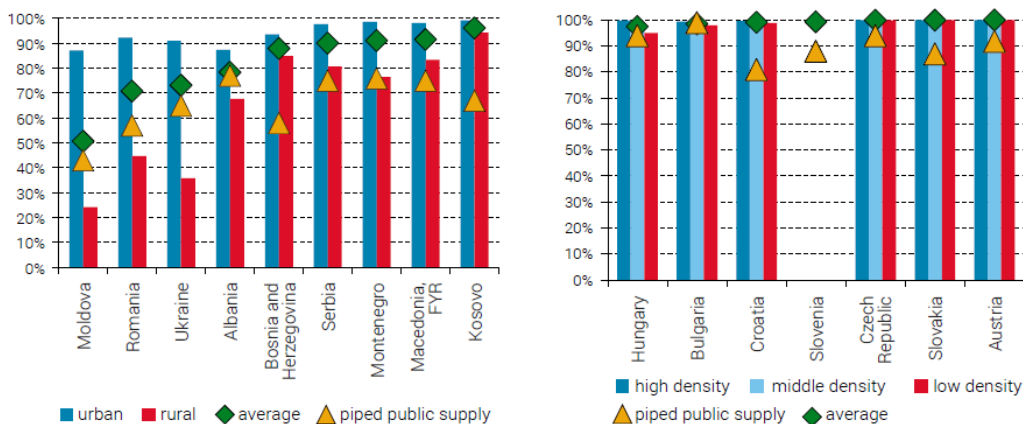
SOURCE: WORLD BANK 2015

Legend: Domestic (Green), Industry (Red), Agriculture (Blue)

2.2 Access (what has happened in the past, what is lacking still – rural access)

The level of access to WSS services in Central and Eastern European countries is high in comparison with the rest of the world; with an average of 83% for piped water supply and 79% for flush toilet. However the situation appears more nuanced when comparing urban and rural situations. The access to piped water ranges from 86% to 100% in urban areas and from 24% to 100% in rural areas.

Figure 4: Percent of population with piped water by location and type of provision

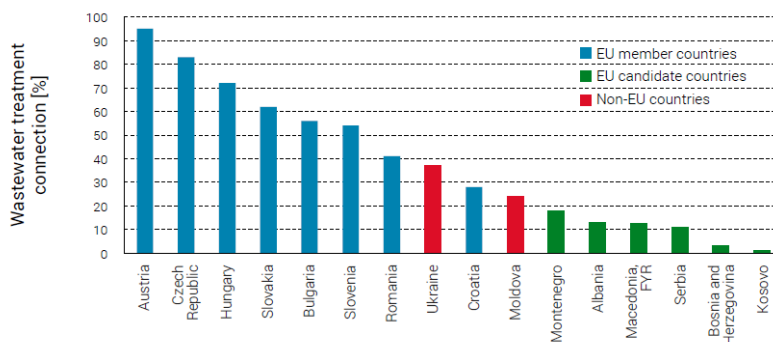


Source: State of the Sector report (World Bank, 2015)

The situation is even more contrasted for access to sanitation services which ranges from 75% to 100% in urban context versus 6% to 100% in rural context. Moreover the access rate to piped public water services amounts to 74% in Central and Eastern European countries and 83% in CEE EU Member States, while access to public sewers reaches 66% in Central and Eastern European countries and 67% in CEE EU Member States.

Most of CEE countries have prepared water strategies which mainly focus on increasing WSS coverage, improving protection of waters from point source pollution, and achieving cost recovery and sustainability of operation within 10 to 25 years. In EU member and candidate countries, the water sector strategies recently prepared lay the emphasis on EU compliance requirements, and objectives aligned with EU water directives transposition. To a certain extent, the outcomes of such strategies have already proved fruitful in some countries. The level of wastewater treatment coverage has significantly improved in Central and Eastern European countries over the past 15 years (Figure 5). This trend has clearly been driven by EU urban wastewater directive requirements as the most dramatic improvements have been achieved in CEE EU Member countries.

Figure 5: Wastewater treatment coverage in the Danube region, 2012

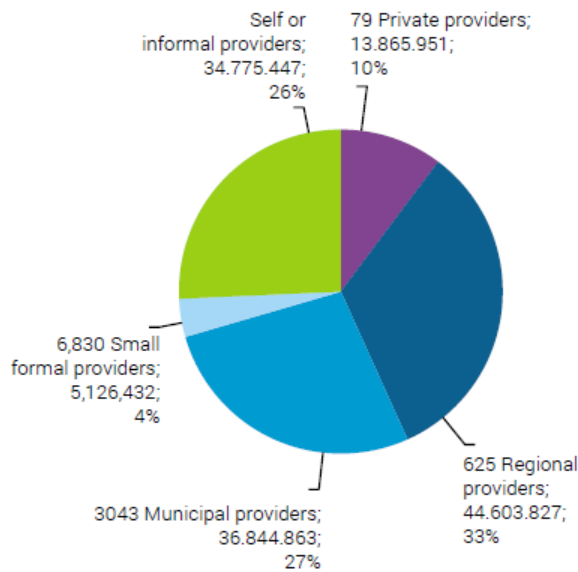


Source: State of the Sector report (World Bank, 2015)

In 2000, about 35% of the total population of the region was connected to a wastewater treatment plant. This situation evolved gradually so that in 2012, 45% of the population of Central and Eastern European countries was connected to a wastewater treatment plant, against only 9% in non EU Member countries. Huge differences persist between countries though, with values as high as 95% for Austria and as low as 2% for Kosovo. In CEE EU Member States, this proportion reaches 62% of the population thus clearly showing the impact of EU environmental legislation and of EU structural funds available for investments in wastewater treatment infrastructure. Wastewater treatment quality is good with an average of 79% of tested samples in full compliance with BOD5 (biochemical oxygen demand after 5 days) standards.

In most Central and Eastern European countries, water services provision and ownership lies at municipal level, sometimes with private sector participation. However, in some countries, aggregation processes have been implemented to group WSS services at regional level. As a whole, there are about 10,000 water service providers supplying 74% of the region’s population (Figure 6). Among these providers, 30.4% are municipal services, 6.3% are regional ones and 0.8% are private operators.

Figure 6: Water service providers and population served in the region



Source: State of the Sector report (World Bank, 2015)

As a result of this scale diversity among providers, the average population served by water utilities varies a lot across countries, ranging from 1,400 customers in Austria to 200,000 in Hungary where an aggregation reform took place in 2011. On average, water supply services in Central and Eastern European countries serve 9,500 inhabitants.

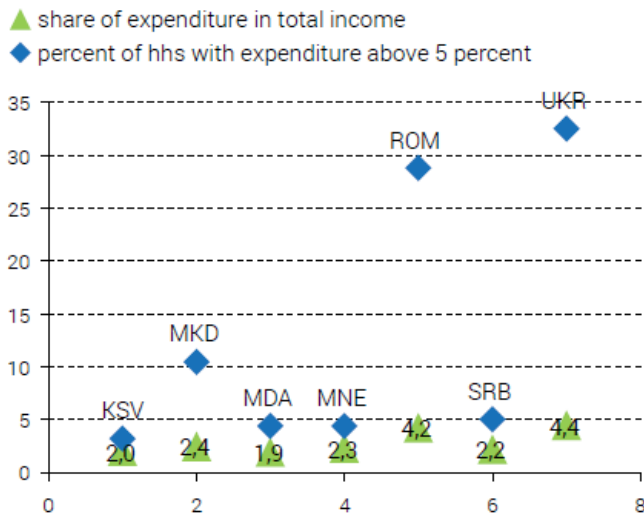
The performance of utilities from Central and Eastern European countries shows a great gap between the 1st wave of EU Member States and other countries. Whereas the former exhibit utilities with performance level reaching international best practices, the latter still lag behind. While non-revenue water amounts to 59m³/km/day in non EU countries, the indicator drops to 14 m³/km/day in CEE EU countries. Similarly, continuity of service reaches 24 hours per day in CEE EU countries compared to 17 hours per day on average in non-EU States. Metering level is high in CEE EU countries with 96% while other countries reach 70% on average. Staff productivity, expressed in population served, is twice as high in CEE EEU States compared to the other countries. The average rate of sewer blockage is four times higher in non-EU States than in CEE EU countries (World Bank, 2015).

2.3 Affordability

As mentioned previously, tariffs have increased in the past 15 years in the region to fund WSS infrastructure improvements and upgrading. The increase over the past decade amounts to 5 to 10% per year. In the meantime, disposable income of domestic customers have also risen. As a result water tariffs remain affordable for a large majority of the population in the region (Figure 7). The average share of water expenditure in household total income remains below the threshold of 5%⁶. However the share of households paying more than 5% for WSS provision amounts to 28.8% in Romania and 32.5% in Ukraine, thus showing important regional disparities.

⁶ Different donor institutions have applied different thresholds for assessing affordability constraints of utility services, including electricity, heating, water, and wastewater. An excellent overview of these thresholds is provided in Fankhauser and Tepic 2005, 5. For water and wastewater, 3 to 5 percent of total income is the typically applied benchmark to assess an affordability constraint

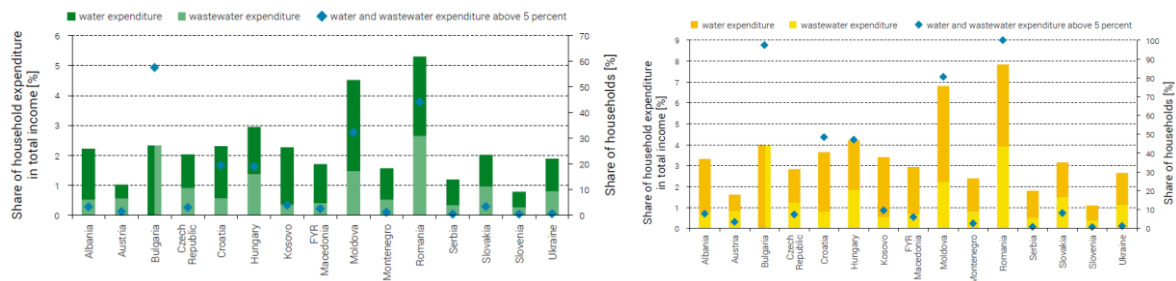
Figure 7: Current average affordability for water and wastewater tariffs



Source: State of the Sector report (World Bank, 2015)

When focusing on the bottom 40% of the population, affordability constraints appear in Moldova and Romania where respectively more than 80% and 100% of households spend more than 5% of their income on water expenditure. As stated in the report, “connecting the largely rural populations in Moldova and Romania to piped water and sewage systems would, at current tariff levels, not be affordable for large segments of the population.” Bulgaria also displays potential affordability issues with close to 60% of its population spending more than 5% of their income on WSS services, and close to 100% of the bottom 40% population.

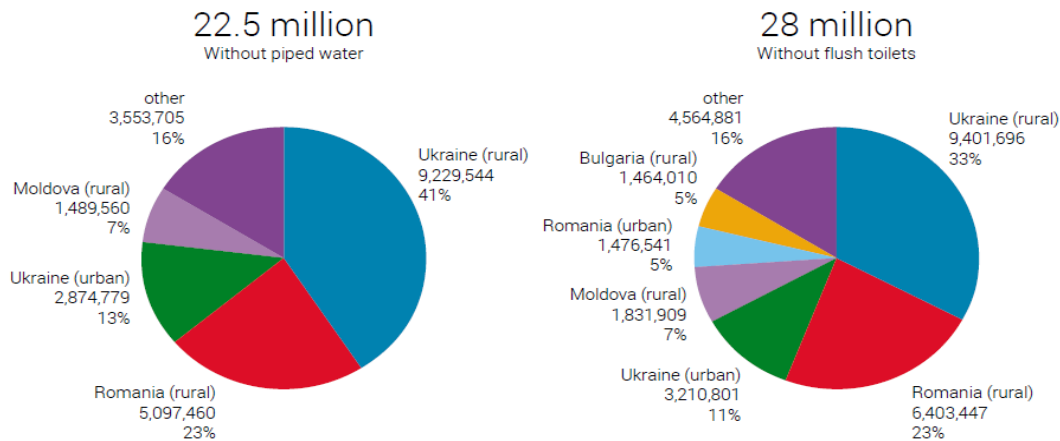
Figure 8: Potential affordability constraint for average incomes and bottom 40%



Source: State of the Sector report (World Bank, 2015)

Taking into account this situation, several countries have set up formal subsidy schemes to support low income water users. In Ukraine, subsidy schemes administered and funded at central level are available for households. In Croatia, cross-subsidies among customers is commonly applied, as well as a lower tariff for the first tariff block for low-income customers. Minimum consumption at subsidized rate is implemented for low-income customers at municipal level in FYR Macedonia. Although the region has witnessed major change and improvements in the WSS sector in the past 15 years, some challenges are still to be addressed. As a whole 22.5 million inhabitants remain without access to piped water and 28 million without access to flushed toilets, especially in rural areas in Romania and Ukraine (Figure 9).

Figure 9: Where are those without piped water or flush toilets in the Danube region?



Source: State of the Sector report (World Bank, 2015)

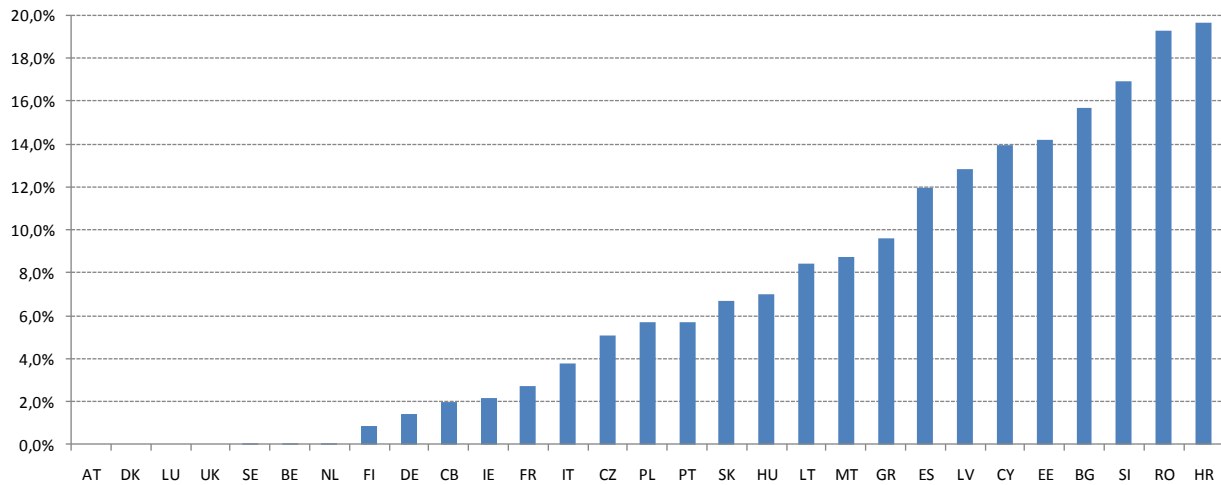
As stated in the report, “a significant number of people do not benefit from piped or public water services in the region, often because they lie outside of the services areas of utility companies. In the absence of better information on whom they receive service from, at what cost, and with what quality, and what would be the welfare and economic impact of providing them with higher levels of service, it is challenging to determine how governments can ensure that their entire population benefits from sustainable services. More work should also be done to understand what least-cost or cost effective service provision technologies, models, or support mechanisms could be implemented to support those populations without necessarily overburdening existing utility companies by making them responsible for those.” Moreover, due to an expected continuous increase of WSS tariffs to fund further asset upgrading and cover operational expenditure, affordability issues might become more stringent in the future.

3. Water governance and regulation

3.1 EU accession and *acquis communautaire*

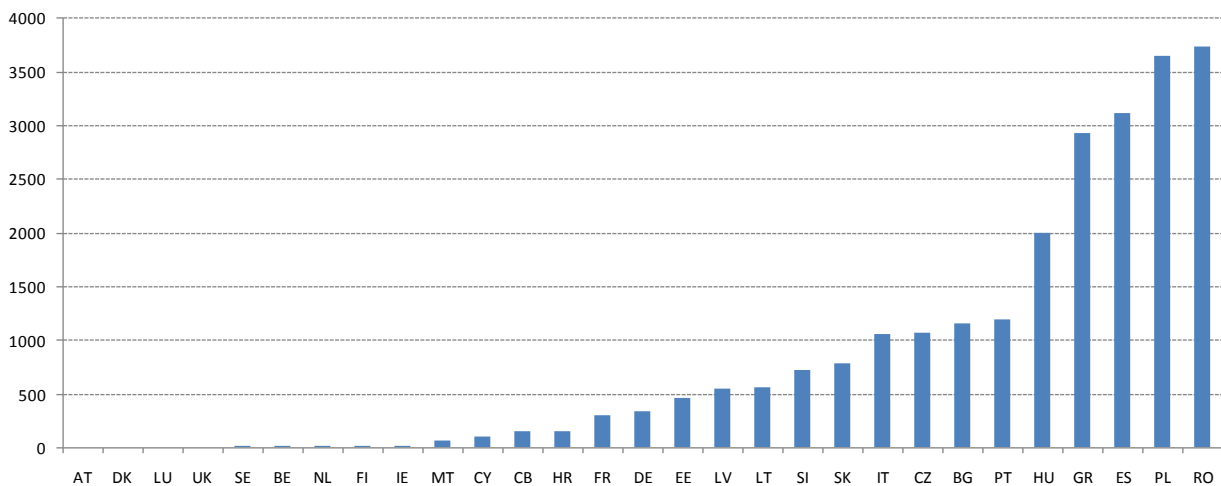
As outlined above, EU accession and EU membership has been a key reform driver in the water sector in CEE countries. On the one hand, the *acquis communautaire* would set quality requirements in the areas of water protection and wastewater treatment in the form of the Water Framework Directive, the Drinking Water Directive, as well as the Urban Wastewater Directive. It was clear from the start of the European Union's eastern Enlargement that compliance with these quality targets would be costly. An initial estimate from the year 2000, quantifying the additional required investments for new Member States (CEE and Baltic countries) to reach compliance with the water directives of the EU was as high as 16 billion Euro (excluding WFD). In many cases this investment push constituted a clear paradigm shift compared to the chronic underinvestment during and before the 1990s. Perhaps it is of little surprise, that the huge investment requirements in the water and even more so in the wastewater sector accounted for a large chunk of the overall funds the countries would receive through the EU structural funds. As Figure 10 shows, water was at least 5% of total structural funds means during the period 2007 to 2013 for all CEE countries. In the case of Bulgaria, Slovenia, Romania and Croatia, it accounted for more than 15% of the structural funds means.

Figure 10: Water related funds (allocated) in % total EU funds (2007-2013)



Source: European Structural and Investment Funds 2014-2020 (European Commission, 2016)

Figure 11: Water related funds (allocated) in Mio. Euro (2007-2013)



Source: European Structural and Investment Funds 2014-2020 (European Commission, 2016)

In absolute terms, large countries and those with significant investment needs like Poland and Romania received more than 3.5 billion Euros through structural funds for water related investments in the period 2007 to 2013. Although these are considerable investments in itself, it is clear that total water investment would be a multiple of these amounts due to co-financing requirements and investment to simply maintain the current service levels. EU related finance is nevertheless an important source of water related investments in CEE countries, particularly in the process of upgrading the systems to achieve compliance with the EU directives.

Another relevant aspect directly related to EU accession was the basic principle of cost recovery, prominently featured in the water framework directive. Although exceptions for social, environmental and economic reasons are within the bounds of the directive (see WFD, Article 9) it also represents a marked difference to the prevailing situation in many CEE countries, where cost recovery was typically very low. Citizens were not used to pay for water services, particularly since in many cases service quality was very low. And despite improvements both in terms of quality and cost recovery, even two decades after the collapse of the Eastern Bloc, full cost recovery is still the exception rather than the rule in many regions in CEE countries (see World Bank, 2015).

Overall, by enforcing higher service quality and cost recovery at the same time, EU accession has put significant (upward) pressure on prices. Although substantial EU funds were funneled into the WWS investment, a sustainable service would not be feasible without increasing the self-financing properties of the regional systems. Apart from simply increasing tariffs, countries in the region adopted two strategies to mitigate the political and social pressure:

- Independent regulatory bodies
- Utility Aggregation

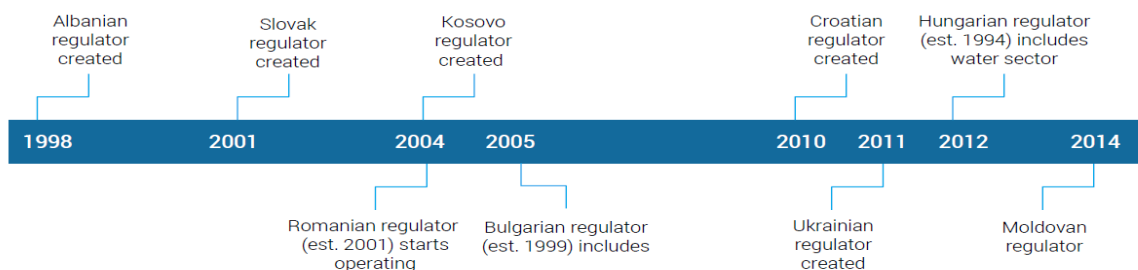
Both measures serve several purposes. Firstly, both aggregations as well as regulatory bodies are expected to increase efficiency, and therefore should help to achieve higher performance without increasing costs. Hence, increasing sector efficiency in itself is a strategy to reduce the pressure to increase tariffs. Secondly, aggregation allows for a cross-subsidization within regions. Particularly geographically disadvantaged regions, very often in rural areas, would be beneficiaries of such a scheme. Having similar tariffs across jurisdictions/municipalities is also thought as to reduce dissatisfaction with "too high" tariffs. Thirdly, regulatory bodies not only enforce service standards and tariffs but can also assume responsibility for unpopular tariff increases. In a sense, having regulatory bodies enables local politicians and utilities to shift the blame for tariff increases to the regulatory agencies.⁷

To summarize, EU accession and the associated EU directives have had both direct and indirect effects on the water sectors in CEE countries. Apart from requiring higher quality standards and pricing policies, it also affected the governance of the sector by inducing aggregation reforms and the institution of regulatory bodies. These two crucial reform types are discussed more in detail in the two following sub-sections.

3.2 Regulatory agencies

Central and Eastern European countries exhibit different models of economic regulation in the water sector. Nine countries have set up a national independent regulatory agency while seven other countries rely on self-regulation and contractual regulation. In countries with a central regulation by agency, the regulatory authorities have been set up during the past 15 years. Albania is the only country having installed its regulator during the nineties (Figure 12).

Figure 12: Timeline of regulatory agencies established in Central and Eastern European countries



Source: State of the Sector report (World Bank, 2015)

Two thirds of these regulatory agencies are multi-sector regulators while one third is water-sector specific (Figure 13). This proportion matches the findings of the OECD survey on the Governance of Water Regulators (OECD, 2015). For most multi-sector regulators, water has been bundled with

⁷ This role of regulatory bodies can be considered in the framework of strategic delegation, where politicians decide on certain "unpopular" tasks to be delegated to a bureaucrat (see Alesina and Tabellini, 2008).

energy (electricity and gas). Several arguments exist in favor of multi-sector regulators compared to sector specific ones. For instance, such bundling can allow for transfer of regulatory expertise as well as synergies and economies of scale between sectors through joint administrative and support activities. As stated in OECD study (OECD, 2015), some regulators also “report the sectors in their portfolio have different business cycles which allow technical staff to work transversally”. Moreover multi-sector regulators are more likely to avoid sector capture and resist political pressure and interference. On the flip side, multi-sector regulators also report that water often takes a lesser importance than the electricity sector on the agenda sometimes resulting in postponed decisions.

Figure 13: Number of water specific regulators and multi-sector regulators, results from OECD survey and Danube Water Program

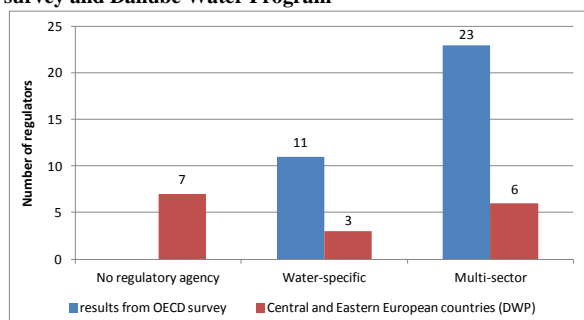
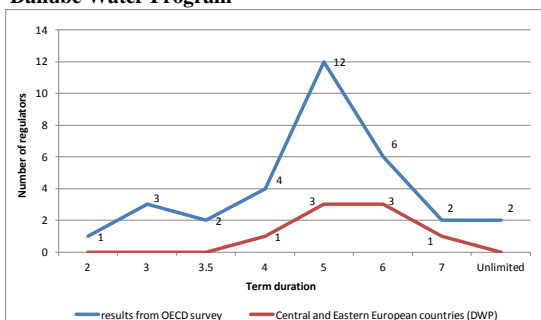


Figure 14: Duration of the term of office of the agency or board members, results from OECD survey and Danube Water Program



Although every regulatory agency is established as independent since their creation, half of them depend on State budget for their financial resources. Direct comparison of staff across agencies is not easy as the number of regulated utilities varies from one country to another, and multi-sector regulatory agencies tend to be more staffed. As stated in the State of the Sector report from the Danube Water Program (World Bank, 2015), “regulators that regulate mostly municipal utilities tend to have a ratio of one staff for three to four utilities, while agencies that regulate large regional operators (Hungary, Kosovo, Romania) tend to have around two staff for each utility” (Table 1).

Table 1: Main characteristics of regulatory agencies in Central and Eastern European countries

	Albania	Bulgaria	Croatia	Hungary	Kosovo	Moldova	Romania	Slovakia	Ukraine
Regulates tariffs?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Licenses operators?	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Handles customer complaints?	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Annual budget	350 000 €	2 000 000 €	160 000 €	15 000 000 €	300 000 €	1 500 000 €			2 175 000 €
Sources of funds	Regulatory fee	Regulatory fee, fines through State budget	State budget	Regulatory fee, fines, other charges	Regulatory fee	Regulatory fee	State budget	State budget	State budget
Scope	WSS	Multisector	WSS	Multisector	WSS	Multisector	All local services	Multisector	Multisector
Water utilities regulated	58	64	157	41	7	40	42	14	147
Staff	5 commissioners	128 total (2+15 employees for WSS)	9 members (part-time) 1 technical	65	11 technical	60 people (7 for WSS)	96 people	6 people	Water 71, total 600
Appointment by?	Prime Minister based on a short-list	Parliament	Parliament	Prime Minister	Parliament (on government proposal)	Parliament		President	President
Mandate	2 x 5-year	2 x 5-year	1 x 5-year	2 x 7-year	1 x 4-year	6-year		6-year	2 x 6-year
Reporting to?	Parliament, Prime Minister	Parliament	Parliament	Parliament	Parliament	Parliament	Ministry of Regional Dvpt	Parliament	President, parliament

Source: State of the Sector report (World Bank, 2015)

All regulatory authorities have the competence of setting or approving water tariffs. Four regulators out of nine set tariffs while others review and approve tariffs proposed by utilities. Hungary faces a specific situation as the tariff-setting formal decision rests within the line-ministry, following the review and advice of the regulator. Tariff setting methodology varies among Central and Eastern European countries with two agencies using revenue cap, three agencies using price cap and another three using rate of return.

In order to set or review prices, regulators use institutionalized and mandatory performance information systems that utilities have to fill in. Two regulators (Albania and Kosovo) implemented a regulatory benchmarking. All regulators, except the Bulgarian one, are in charge of issuing licenses to the operators, and two thirds are competent to handle customer complaints. The time frame of the regulation commissioners mandate varies from 4 to 7 years, with a possibility of renewal for half of the regulators. This finding is in line with the OECD survey (OECD, 2015) where the most common mandate duration ranges from 5 to 6 years (Figure 14).

Most regulators report to the Parliament while three of them are also accountable to the representatives of the executive power. In all Central and Eastern European countries, water quality regulation is a competence of the public health ministry while environmental regulation lies under the environmental ministry or agency.

Although half of the countries in the region have implemented policy reforms and set up national regulatory framework, “regulators often struggle to extend their regulatory reach over large numbers of local public service providers and achieve meaningful regulatory outcomes. Sector financing strategies have not been developed upon adoption of the cost recovery principle. Utility companies and management continue to be largely driven by local interests. In many cases, those reforms have not yet borne fruit, and the analytical work done under the State of the Sector review shows that the long-term impact of such policies is still to emerge” (World Bank, 2015).

3.3 Aggregation reforms

One of the most important trends in the WSS in CEE is aggregation reforms. To understand this reform drive in the region, it is helpful to first consider the territorial fragmentation and its evolution since the breakdown of the Soviet Union. As Table 2 shows, the last three decades in the region were characterized by a number of intensive decentralization reforms. Particularly during the 1990s in many countries in the number of municipalities increased considerably. Similar to the argument of Foster (2005) for water sector reforms in Southern America, these territorial reforms appear to stem from a commitment to federalism rather than a step to address issues in water (or public service) governance. And although territorial fragmentation has become to be seen a major obstacle for an effective functioning of the local government system and first reversal tendencies can be observed (see Swianiewicz (2010)), it is unlikely that the number of municipalities will reach the levels of 1990.

Table 2: Number of municipalities in selected CEE countries

Country	Number of municipalities		
	1990	After decentralization	Currently
Bosnia and Herzegovina	109	143	142
Croatia	115	543	556
Czech Republic	4104	6230	6253
Hungary	1368	3133	3152
FYR Macedonia	30	123	80
Romania	2948	3190	3181
Slovakia	2694	2875	3029
Slovenia	62	210	210

Sources: Council of Europe (2009), De Ceuninck et al. (2010), Swianiewicz (2010), and Carvalho et al. (2012), World Bank (2017)

While territorial fragmentation appears stable, in the water sector a number of countries have embarked on aggregation reforms in recent years to deal with fragmentation in the WSS. As a recent study on water utility aggregation shows, nowhere around the world are aggregation reforms as frequent as in this region. More than 50% of all aggregations worldwide took place in Europe and Central Asia, with Central and Eastern Europe contributing the bulk of the aggregation cases (see World Bank, 2017). In addition to a number of countries already having implemented reforms or with on-going aggregations, a number of countries are at the stage of ex-ante evaluations for potential aggregation reforms (see Table 3).

Table 3: Status of aggregation reforms in CEE countries

Country	Aggregation reform		
	Completed	On-going	Discussion
Albania			X
Bosnia and Herzegovina			
Bulgaria			X
Croatia		X	
Czech Republic			
Hungary	X		
Kosovo	X		
FYR Macedonia			
Moldova			X
Montenegro			
Romania		X	
Serbia			
Slovakia	X		
Slovenia			
Ukraine			

Source : Based on World Bank, 2015.

The specifics of the aggregations in CEE vary considerably. Although in most cases the process was mandatory, the speed and scale (level of aggregation) of the reforms varied considerably. To illustrate the various aggregation approaches in the region, in the following the cases of Romania and Hungary are briefly described:

Romania:

Before 1990, water supply in Romania was heavily centralized at county level. Similar to most Eastern European countries, after the fall of the Soviet empire, a process of decentralization was initiated, which also implied a shift of water provision to municipalities. Since then, water and wastewater are mainly carried out by local governments. As reported in Kruijf et al. (2009) and OECD (2009), a number of problematic issues prevail in the Romanian water sector. Firstly, there is a mismatch in responsibility because municipalities lack the financial resources to maintain the infrastructure and provide the service. In addition, financing is hampered because there are strong political reasons for local governments not to increase tariffs.

Given the chronic under-investment and financing gap that translated into low connection degrees (only 50% of the population are connected in 2004), a large share of unaccounted for water as well as low cost recovery, Romania took several measures to improve the situation and finally meet EU standards. The core element of these reforms plans is a regionalization initiative. Municipalities remain owners of the local infrastructure but delegate the service jointly (through a so-called Intercommunity Development Association (IDA)) to a Regional Operating Company (ROC). Hence, the relation between authorities and operators is changed in the sense that a whole regional service area is contracted to a regional operator. This requires that multiple local operators (more than 900) merge into one ROC (target 40-50), where municipalities share joint ownership (see OECD (2009)). According to a study by Kruijf et al. (2009), the improved access to EU cohesion funds seems to have been an important driver, also giving local governments an incentive to support the regionalization plans: ... most interviewees indicated that the establishment of the IDA was not such an important change. It was rather a formality that needed to be fulfilled in order to merge water services into one ROC and to get access to EU funds.

Hungary:

Over the last 25 years, Hungary's water sector has experienced an important decentralization process which has been partially reversed over the last years. In the 1980s, there were 33 water and sewage companies in Hungary. They were state owned and centrally governed (see Regional Environmental Center for Central and Eastern Europe (2009)). Following the transition in Eastern Europe, in the early 1990s, assets of these companies were transferred to the municipal level. This decentralization pattern is consistent with the above mentioned regional fragmentation that was experienced by Romania and many central and eastern European countries. However, governance of these companies with their large number of diverse municipal owners proved to be difficult due to the complicated and sometimes conflicting interests (see Regional Environmental Center for Central and Eastern Europe (2009)). As a reaction to these coordination problems, the companies were split up, resulting in over 300 utilities as of 2009. Many of them would serve a single municipality only.

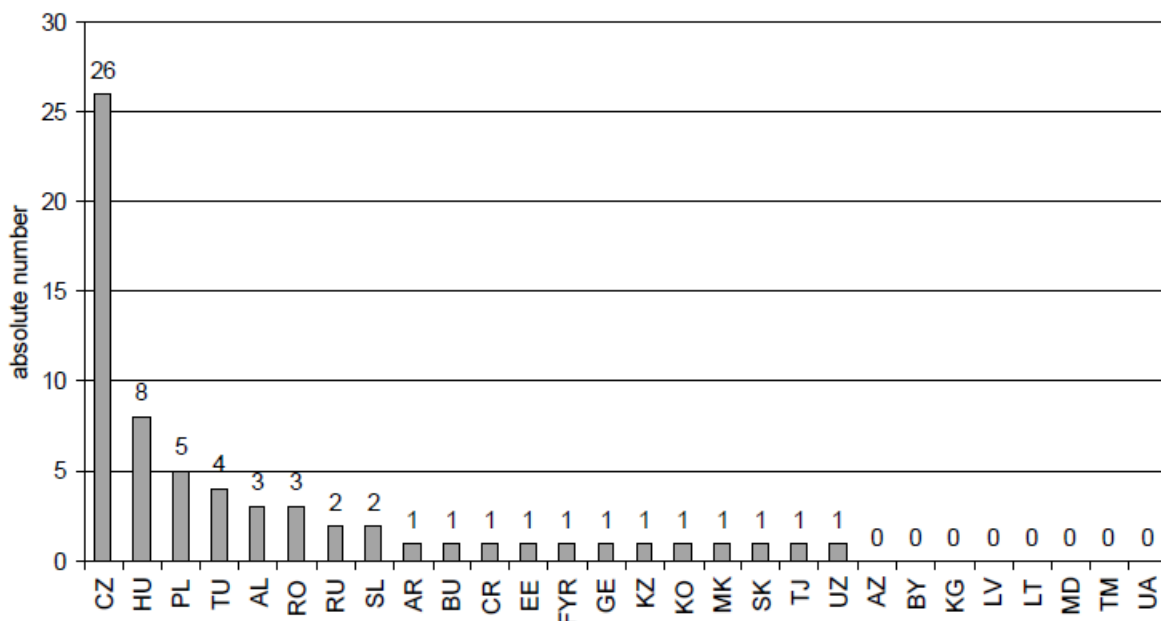
More recently, the water sector in Hungary experienced a reversal of the previous disintegration trend: more and more small municipalities contract out their services to large water utilities. The main motives lie in the need to acquire technical expertise to meet increasing standards, which are also linked to EU accession, but also cost considerations. Hence, today's situation is characterized by an increasing concentration of the sector, with small municipalities employing a kind of management contract to outsource service provision to large public utilities instead of providing the service themselves (see Regional Environmental Center for Central and Eastern Europe (2009)). A further step into this direction has been made by the Hungarian government with the 2011 water utility act. The key pillars of this major reform project are centralized tariff setting, institution of a regulatory agency (Hungarian Energy Office) and the setting of the minimal utility size to serve at least 150,000 persons. Following the gradual implementation until 2016, the regulatory agency has started to give out operating permits and it is expected that only 40 to 50 utilities will remain after 2016 (see Regional Centre for Energy Policy Research (2009)). Finally, to ensure comprehensive access to water services, utilities can also be obliged to serve more remote and disadvantages areas.

As outlined above, an important goal of the aggregation reforms in CEE is to reduce the pressure on tariffs associated with an improved service quality and expanded access. Apart from efficiency gains through economies of scale, also the possibility of cross-subsidization between towns and regions plays a role. With respect to the economic motivations, they are largely based on the note that utilities serving larger towns tend to exhibit lower unit costs when providing WSS services. Although this relationship also appears present in the case of CEE, the evidence whether consolidations can reap these efficiency gains is mixed. Importantly, as shown in Klien and Michaud (2016), one-off cost increases and losses in service density can outweigh the economies of scale from larger operations. The loss in density is particularly pronounced for large utilities which initially served a single city. Depending on the setup, the results in Klien and Michaud (2016) suggest that unit costs of aggregated utilities can be higher even several years after the aggregation. Overall the design and process of aggregation seem important in determining whether aggregations lead to economies of scale. Despite these concerns, there is little evidence that the observed aggregation trend is about to come to a sudden stop.

4. The role of the private sector for water services in CEE

After the fall of the eastern Block, most central and eastern European countries tried to restructure their economy towards a more market based system by using privatization, albeit with large differences in intensity and design of the process (See Mayer, 2003). Although the same is true for the water sector, a number of differences arise: Firstly, in contrast to the typical sale of State-owned-Enterprises in manufacturing, asset sales in the sense that the public infrastructure (pipe network, treatment facilities) was transferred to for-profit firms is rather rare. The typical approach for private sector participation in the WWS is through concession, lease, and management contracts, or through types of private sector participation (PSP) arrangements. Secondly, in a number of countries the sale of public water and sanitation related assets is restricted. E.g. despite the relative high level of PSP in Hungary, the public (usually the municipality) has to retain at least 51% of assets in mixed-public-private companies. A first stocktaking of the presence of private sector participation can be found in World-Bank (2003), which highlights the considerable country differences in PSP uptake:

Figure 15: Number of PSP Projects in water in Central and Eastern European Countries until 2003



Source: World Bank, 2003

As shown in Figure 15, three countries (Czech Republic, Hungary as well as Poland) along the former iron curtain account for the bulk of the PSP projects until 2003. Particularly the Czech Republic, with more than 25 projects until 2003 holds a particular position. Hungary with 8 cases and Poland with 5 cases also distinguish themselves from the average. While the majority of countries in the region seem to have experimented with some sort of private sector participation, it was typically limited to one or a few singular cases. There appears to be a strong correlation between the level of development of a country (in a broad sense) and the take up of PSPs. Among others, typical factors that appear to account for the large country differences are related to the institutional development, the state of the sector before the transition, the macro-economic performance of a country, and household income (see World-Bank 2003). Another common factor of the PSP experiences is that in a large number of cases major cities rather than small rural municipalities were involved. This focus on utilities with large customer bases is probably related to the considerable transaction costs related to setting up a PSP, requiring a certain size of contract to be financially interesting for private partners. Given this focus on large agglomerations, it also explains why the share of population served through these PSPs can be considerable despite the small number of PSP cases.

Although no recent and comprehensive study is available, auxiliary information from the IBNet Database⁸ suggests that there has been little systematic change in the use of PSP in CEE countries since the early 2000s. While the figures are not perfectly comparable to Figure 15 – partly due to varying samples -- also in the restricted sample of IBNet utilities, the Czech Republic exhibits most PSP cases, and Hungary, Poland, along with Bosnia and Herzegovina (not covered in Figure 15) and Romania exhibit a significant number of cases. Overall, the picture has changed little since 2003, with some countries adding PSP cases whereas others reduced the number. The general stagnation is possibly related to the overall re-municipalization trend in water in Europe and worldwide, which has put a spotlight on local governments and their choice of service provision.

Table 4: Cases of private sector participation in the sample of IBNet utilities in CEE countries.

	Number of cases in IBNet										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Bosnia and Herzegovina	8	8									
Croatia	1	1									
Czech Republic	12	12	13	14	14	14	14	13	8	8	8
Hungary	4	4	7	3	3						
Macedonia, FYR						1	1	1	1		
Poland	3	3	3	3	3	3	3	3			
Romania	6	6	6	6	6	5	5	5			
Slovak Republic		1	2	3	3			1	1	1	1

Source: IBNet

⁸ The International Benchmarking Network for Water and Sanitation Utilities (IBNet) is an initiative to encourage water and sanitation utilities to compile and share a set of core cost and performance indicators, and thus meet the needs of various stakeholders. It sets forth a common set of data definitions and a minimum set of core indicators, and provides software to enable easy data collection and calculation of the indicators. It also provides resources to analyze data and present results.

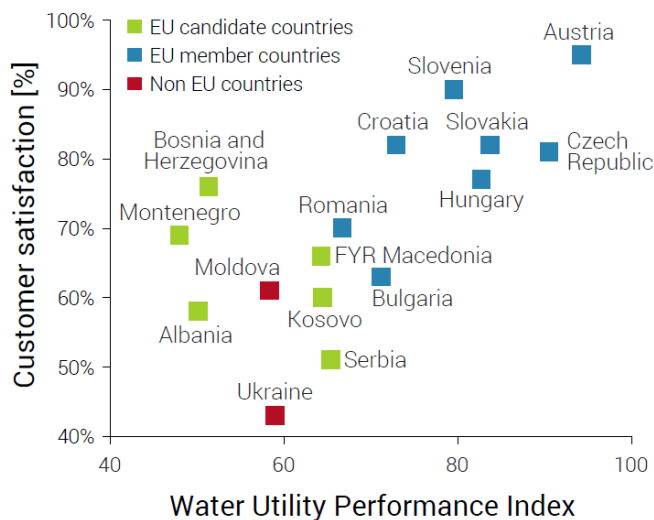
5. Sector performance

The most recent empirical evidence on the performance of the water sector in the CEE countries is World Bank (2015). Several performance dimensions are analyzed in the report and described on a country by country basis:

- Service quality, customer satisfaction:

Water service is to a large extent continuous and drinking water meets national quality standards. Service quality is higher in countries with higher standards of living, with Albania and Moldova experiencing the largest difficulties in ensuring continuous water supply. Service quality as measured by a composite Water Utility Performance Index (WUPI) is strongly positively correlated with measures of customer satisfaction (see Figure 16). Although customer protection mechanisms are still rather rare in CEE countries, the independent regulatory agencies in many cases serve the role of a mediator.

Figure 16: Relationship between customer satisfaction and water utility performance index (WUPI)



Source: World Bank (2015)

At the same time, there is typically a large disparity between urban and rural regions. Similar to the above mentioned differences in access, service quality also tends to be considerably higher in urban regions or is not even assessed in rural areas.

- Utility performance:

Both aggregate country level data but also utility level data from IBNet suggest that utility performance in the CEE countries has improved over the last two decades. There is more widespread metering, staff productivity is improving, and commercial efficiency is on the rise. However, a few caveats remain: Firstly, while performance has most clearly improved, sometimes considerably, the case is less clear for efficiency in the sense of input output ratios. For instance, WUPI scores have increased over time, and particularly badly performing utilities have made the biggest improvements. However, the performance improvements typically came at higher cost. The question if the utilities have moved closer to the efficiency frontier is an open issue. To some extent, the recent trends of utility aggregation and institution of regulatory agencies can be seen as reforms to raise efficiency. For instance, the findings in World Bank (2017) suggest that many aggregation reforms in countries with a sufficiently high level of service quality aim to reduce cost. This would suggest that the apparent increase in service quality is now followed by a stage that seeks to push utilities to the efficiency frontier

To summarize, the evidence on sector performance in CEE countries suggest that the service levels and service quality has been improving over time. Utilities and countries with low initial performance and efficiency improve the most – which is a sign of convergence in the sector. Nevertheless, the speed of adjustment is still varied, and also cases of performance decreases are not infrequent (see World Bank, 2015). It therefore remains to be seen if the investment push through EU accession, which has been observed in many countries, has been enough to elevate the WWS to a high level equilibrium, where high quality can be sustained through sufficient funding.

6. Summary

This chapter has tried to sketch the main features of water services in Central and Eastern European countries. To understand the current situation, the chapter has analyzed the challenges of the sector – access, service quality and affordability -- which at least partly originate from the policies of centralization and chronic underinvestment until the fall of the eastern bloc.

Since then, the path to EU accession and particularly the *acquis communautaire* has been identified as a major game changer in water practices. Firstly, it has put in place significant and ambitious quality requirements for the water and wastewater sectors through various directives. Secondly, it has enforced the principle of cost recovery, which started from very low levels. This reform path has also been associated with two important trends in the CEE countries. The creation of independent regulatory bodies for water on the one hand, and the frequent occurrence of aggregation reforms on the other. Somewhat in contrast, private sector participation was on the rise until the early 2000s but has largely stagnated since then and overall plays a minor role in the WWS sector. Finally, although the sectors performance has improved consistently over the last two decades, the question is whether the utilities have been able to switch to a model of service delivery which can still be sustained in the absence of external funding. Efficiency enhancing reforms, as potentially through aggregations, might be the next logical step in CEE countries.

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