WORKING PAPER

The Water Sector in Germany

Johann WACKERBAUER

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Johann WACKERBAUER

Institut für Wirtschaftsforschung e.V., Universität München, Deutschland

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CONTENTS

1. INTRODUCTION

In Germany, water supply and wastewater management are core tasks of public services of general interest within the competence of the municipalities. For the German water industry it is characteristic that environmental and health policy objectives are mainly pursued via the organization of the water supply (provision of goods and services through regional monopolies in the public domain) and less through the employment of concrete instruments aimed at the respective environmental political objectives. Water management competence in Germany is clearly located at the municipal level, which admittedly restricts international competitiveness.

The German water sector is still an exception area in terms of competition law. In contrast to other network industries like electricity or telecommunication almost no competition takes place in the German water supply, which is to a high degree organized in decentralized, small scaled, regional monopolies. In Germany there are still some 6,400 water utilities and some 7,000 waste water companies existing. Despite isolated privatization of some municipal water companies, no competition in the sense of a liberalization of the market exists. Most water and waste water companies are publicly owned, especially the smaller ones. Only a few private companies are serving some of the urban agglomerations in Germany.

Compared to other countries, the German water sector is very fragmented and small-scaled. This makes it very difficult to catch up with the global players on foreign markets. That is the reason why the German structure of water services is an obstacle on international markets for water and wastewater services. On the other hand, water quality and the security of water supply are very high. So the question arises, whether the regulatory framework should be changed and whether the current strong municipal anchoring of the water sector in Germany should have to be relaxed in favour of the build up of vertically integrated water concerns with the risk that security of supply and drinking water quality will have to be sacrificed for this competition with its uncertain outcome. The water supply companies in Germany, well-known for their high quality of drinking water, have in the past invested ca. € 2.5 billion annually in a high technical standard which has increased costs and resulted in rising prices. Therefore, with respect to municipal water, a high potential for rationalization was presumed, and the question regarding operational efficiency and the participation of private bidders in water supply companies became increasingly important.

2. THE REGULATORY FRAMEWORK

The legal framework in Germany concerning water resources management and protection is defined by European legislation, national legislation and the water law of the federal states. With respect to the European legislation, the Water Framework Directive 2000/60/CE, which is in force since 22nd December 2000 should be mentioned in the first place. The Water Framework Directive (WFD) requires that all water bodies reach a good state until the year 2015. For the groundwater this means the good state both with respect to quantity and chemical state. A good quantitative state means that an equilibrium between groundwater withdrawal and groundwater recovery will be reached. In Germany, this has been already realized for 95 percent of all groundwater bodies. The concretization of the good chemical condition took place in the meantime via the daughter guideline on groundwater. It specifies environmental quality standards for nitrate of 50 mg/l and for pesticides of 0.1 µg/l. Additionally the member states must specify threshold values for other parameters, if they contribute in the respective water body to a load or are located in the minimum list. In the context of the 2004 inventory admission for the Water Framework Directive it was determined that about 52% of the evaluated groundwater bodies in Germany do presumably not achieve the good chemical condition without further measures. Further emphasis of the WFD for surface waters is on the combined approach of emission- and immission-referred measures for pollutant reduction as well as the definition of European-wide environmental quality standards for 33 dangerous materials. For water services (water supply and sewage disposal) the fundamental obligation to the application of the cost recovery principle is valid. Further the WFD pursues a comprehensive concept of river basin planning, which is oriented at the natural arrangement of the river catchment areas and therefore extends the borders of the Federal states and the European member states, which makes strengthened co-operation between different administrative bodies and states necessary.

Further instruments of the EU water policy are the Groundwater Daughter Directive for the protection of the groundwater from contamination and degradation (2006/118/CE), the Directive on Urban Wastewater Treatment. (91/271/EEC), which obligates the municipalities to the cleaning of waste water from households and small firms, the directive for the protection of waters from pollution by nitrate from agricultural sources (Nitrate Directive - 91/676/EEC), which concerns the decrease of the nitrate entries from agricultural animal husbandry, the Bath Waters Directive (76/160/EEC and 2006/7/CE) with special quality requirements at bath waters places and the guideline on the quality of water for human use (Drinking Water Directive - 98/83/EEC) with special quality requirements for the drinking water.

Apart from these specifically water-law related guidelines also different parts of the Community's environmental law are relevant for water resources management, like the Directive on Integrated Pollution Prevention and Control (IPPC Directive 96/61/EEC) with its medium-spreading requirements to selected industrial branches or the Directive on the Distribution of Plant Protection Agents (91/414/EEC).

With the Federal Law in the first place the Federal Water Act (Wasserhaushaltsgesetz WHG) of 1957 is to be mentioned, last amended on 31 July 2009, which as basic national framework legislation meets fundamental regulations for water management with respect to water quantity and water quality. The Federal Water Act requires sustainable management of water bodies with the goal to improve their function and efficiency with respect to public welfare as well as in conformity with the interest of particular water users (see § 6 WHG). Waters uses like the withdrawal of water or an introducing of materials require a permission or a grant according to the WHG. The permission stands in principle in the discretion of the responsible water authority. This discretion is limited in certain cases for the sake of the protection of water bodies. So a permission may be given to the sewage inlet only, if it fulfills certain minimum requirements, which correspond to the state of the art (see § 57 WHG). The minimum requirements are made more concrete in the federal waste water regulation. The appointment of water protection zones is another important instrument of the Federal Water Act. Beside this a number of planning instruments is existing, i.e. sewage disposal plans, pure retaining orders, water management plans and water framework plans.

In some federal states, charges for the abstraction of ground and surface water are levied, the so called "Water Cent" (see Table 1). In addition, the municipalities in the context of their statute sovereignty can levy charges on the water supply and sewage disposal and issue supplementary regulations for the disposal into their sewage systems.

The Sewage Charges Law of 1976 (Abwasserabgabengesetz AbwAG), last amended in 2005, plans that for the direct introduction of waste water into a water body an effluent charge has to be paid. This was the first environmental protection tax in Germany which brought the polluter pays principle to application, since the producer of sewage must compensate at least a part of the external costs that are caused by the pollution of the environmental medium water. The charge rate depends on the quantity and the injurious character of certain introductory materials. The charge per unit was increased from DM 12 in the year 1981 in several steps up to DM 70 since 01.01.1997 (converted to € 35.79 since the beginning of 2002). The sewage charge should create economic incentives to reduce sewage as much as possible. Therefore the Sewage Charges Law allows charge reductions for the case that the polluter fulfills certain minimum requirements for sewage treatment. In addition certain investments costs for the

improvement of the waste water treatment can be substracted from the payments. The sewage charge is to be paid to the federal states and the revenue is exclusively used for the financing of measures for the preservation and the improvement of water quality.

Table 1: Water abstraction levies in Germany

Water Cent per m^3 of yielded drinking water volume according to Federal States

federal state	amount of water cent	notes	annual payments	utilization
Baden-Wuerttemberg	**5.1**	since 1988 ("SchALVo")	amount not known	no purpose limitation
Bavaria	**-**			
Berlin	**31**		approx. 55 M. €	groundwater protection
Brandenburg	**10.2**	with two increases since 1984	approx. 20.2 M. €	implementation of the Water Framework Directive, maintenance of dikes, etc.
Bremen	**5**	existing since 1993, confirmed in 4/04	approx. 0.7 M. € from Water supply utilities	
Hamburg	**7 or. 8 resp.**	since about 12 years, increased in 12/05	3.0 M. € from wsu*	
Hesse	-	abolished in 1/03		
Mecklenburg-Western Pomerania	**1.8**	continuation of the water abstraction levy of the former GDR, confirmed in 1/03	approx. 1.7 M. €	for "groundwater-friendly measures"
Lower Saxony	**5.1**	confirmed in 12/04	approx. 20 M. € from water providers	for "groundwater-friendly measures"
North Rhine Westphalia	**4.5**	since 1st February 2004	72 M. € for drinking and service water (2005)	federal state budget, implementation of WFD[2)]
Rhineland-Palatinate	-			
Schleswig-Holstein	**5 or. 11[1)] resp.**	since 1st January 2004	approx. 24.5 M. €	purpose limitation was reduced at 50 %
Saarland	**(6 or. 7 resp.)**	introduction in 2007 proposed by the Saarland government	(probably up to 3 M. €)	(purpose limitation in some case)
Saxony	**1.5**		approx. 3.4 M. €	purpose limitation
Saxony Anhalt	-			
Thuringia	-			

[1)] 5 Cent: for industrial undertakings as final consumers, provided that more than 1,500m^3 of water are purchased within the assessment period, 11 cent: by other final consumers

[2)] may be set off against expenses within the scope of co-operation with agriculture

[WFD = Water Framework Directive] *wsu = water supply utilities

Source: ATT, BDEW, DBVW, DWA, VKU 2008.

The responsibility for water pollution control and the management of surface waters in most of the German federal states is distributed over several levels. In the larger area states these are:

- The superior water authority (as a rule the Ministry of the Environment) with the responsibility for strategic decisions.
- The upper, higher or middle water authority which, as a rule, is assigned to the district committees or regional governments and is responsible for the regional water management planning.
- The lower water authority (cities, towns, urban and rural districts as well as water management offices) with monitoring, technical advice and executive functions.

The Federal State Working Group Water (LAWA), which was established in order to harmonize Federal State water laws, is made up of the superior water authorities. The Federal States have also formed working groups for the co-ordination in the management of river basins.

3. OWNERSHIP AND ORGANIZATIONAL ARRANGEMENTS IN THE GERMAN WATER SECTOR

3.1 The liberalization debate

In the 1990ies there was a controversial debate on liberalization and privatization of German water supply. Supporters of liberalization argued that competition and private ownership would lead to more efficiency in the water sector and to lower prices for tap water. Their opponents argued that privatization would result in a decline of environmental standards and drinking water quality. Recently, the liberalization debate on water services in Germany has turned into a discussion about the modernization of the water supply. However, even this modernization strategy contains elements of competition as, according to the ideas of the Federal German Ministry of Economics, it includes, inter alia, the equating of the supply of drinking water and disposal of wastewater with respect to taxation and legal aspects, the introduction of full coverage benchmarking, the tasking of private third parties as well as incentives for increased co-operation in the water industry. In view of considerations on the part of the European Commission, following a new legal framework for public-private partnerships to establish a general tendering obligation for services of water supply and wastewater disposal, the German water industry now once again fears the pressure of liberalization.

The liberalization and privatization debate in Germany must be viewed against the background of a traditionally strong municipal administration. The privatization of the water supply in Germany, in contrast to other countries, is only one legal option but not a national action. The German privatization model prefers a regulation of the privatized company via its supervisory bodies. By sending representatives of the public authorities into these supervisory bodies, the business policy of the water provider can be influenced. There are basically two different forms of this type of privatization and one mixed form.

- Formal privatization or organizational privatization: In this case the task of supplying water is retained by the previous administrator; only the operating agency is transformed into a business form under private law, for example by transforming a municipal department or a semi-autonomous municipal agency into a municipal enterprise. Despite formal privatization, public structures are maintained which, however, with regard to independence and flexibility, are to approximate the management of public-law companies.

- Material privatization or functional privatization: Here the administrator delegates his tasks to a private party. The relinquishment of the public inventory of tasks can be revocable or final. A regulation of the privatized company takes place in both cases through the creation of supervisory boards and the naming of supervisors within the company.

- Mixed form of privatization: Well-known in Germany, the so-called “Berlin model” is a mixed form in which private companies participate in a municipal enterprise. With the partial privatization of the Berlin Water Works (BWB) in 1998, a holding model was selected with which the Federal State Berlin received 50.1% of the shares in the strategic controlling holding, Berlinwasser Holding Aktiengesellschaft. The remaining 49.9% of the shares in the Berlinwasser Holding Aktiengesellschaft was acquired by an associated incorporated company established by an investor consortium. The business purpose of the Holding is the control and further development of the competitive business and the control of the Berlin Water Works. Thus, the legal form of the Berlin Water Works as a corporation under public law remained unchanged, but the competitive businesses were spun off and were transferred into the Berlinwasser Holding Aktiengesellschaft.

The municipal corporations and municipal public utilities are typical in the German system for operating the infrastructure systems necessary for the water supply, as are the inter-municipal agencies, which were established specifically for these tasks. The German system functions essentially without formal, external regulation of water rates, tariffs or returns on investment. The fixing of prices takes place according to the cost-covering principle. As no private enterprise profit motive is

present, only cost covering rates and public fees for the municipal water services are charged. The liberalization of the water supply in Germany remains rather half-hearted, and even in the case where the legal form of the water supply firms is transmitted from public to private law, the municipalities keep a substantial influence on the strategic decisions by holding at least a 50.1% majority in the new firms under private law, a construction which is summarized under the term "public-private partnership".

3.2 Organizational arrangements

To understand the specific situation in Germany one has to be aware of the different organizational arrangements in the German water supply. A water work can be a single utility, but it can also be part of a municipal multi-utility. In both cases ownership can be public or private, although in the end the municipality is in any case responsible for the functioning of water and sewage services. Even if the organizational form of the water company is private, the municipality can keep a majority at this private firm to keep its influence on strategic decisions.

In the following the variety of organizational arrangements for the water sector in Germany is described. First, the arrangement which is most closely connected with the public sector is the municipal department (Regiebetrieb). If the water utility is organized as municipal department, it is a legally and organizationally dependent part of the municipality with its finances integrated in the general community budget. A little bit more independent is the water utility if it is organized as semi-autonomous municipal agency (Eigenbetrieb). This agency remains a legally dependent part of the municipality, but it is operating a clearly defined budget on its own which implies that it is to a higher degree independent in investment decisions. Another state-owned arrangement is the public law incorporation (Anstalt des öffentlichen Rechts), which is a firm under public law with its own legal status that can be set up by a state body only on the basis of a specific law.

Beside these single firm arrangements there is the possibility of co-operation between several water utilities that come together in an inter-municipal agency or a water and soil management association (Zweckverband / Wasser- und Bodenverband). These are mainly associations of municipalities that accomplish their tasks jointly. With their own legal status, both organizational arrangements are less dependent from single responsible municipalities than municipal departments are.

Regarding the arrangements under private law, the municipal enterprise (Kommunale Eigengesellschaft) is to be mentioned first. It is organized as a limited liability company or as an incorporated company with the entire shares kept held by

the municipality. The firm is independent of the local government in terms of its organization and its budget, but the municipality has a comprehensive influence through the supervisory board. Mixed forms of ownership are well-known under the term “public-private partnership”: These are organizational arrangements where both public and private bodies hold the shares of a company under private law. Usually a small majority (i.e. 50.1%) remains with the municipality which keeps its influence on strategic decisions by this way.

With respect to arrangements under private law it has to be distinguished between the formal privatization on the one hand and the material privatization on the other hand. In the case of the formal privatization or organizational privatization the task of supplying water is retained by the previous administrator; only the operating agency is transformed into a business form under private law, for example by transforming a municipal department or a semi-autonomous municipal agency into a municipal enterprise. Despite formal privatization, public structures are maintained which, however, with regard to independence and flexibility, are to approximate the management of private-law companies. In the case of material privatization or functional privatization the administrator delegates his tasks completely to a private party. The relinquishment of the public inventory of tasks can be revocable or final. A regulation of the privatized company takes place in both cases through the creation of supervisory boards and the naming of supervisors within the company.

During the period 1997 – 2005 significant structural changes took place with respect to these organizational forms. Public utilities that were organized as municipal departments in former times were transferred into more independent organizations: In the water supply sector the municipal enterprise and public-private partnership (PPP) models dominate. The share of PPP models in total water supply even increased from 20% in 1997 to 25% in 2005 whereas the share of the semi-autonomous municipal agency decreased from 23% to 4% at the same time (see table 2).

Table 2: Organizational arrangements in the German water supply
(% of water supplied)

	1997	2002	2003	2005
Municipal Department	1 %	3 %	0,5 %	1 %
Semi-Autonomous Municipal Agency	23 %	13 %	15 %	4 %
Inter-Municipal Agency	19 %	17 %	16 %	15 %
Water and Soil Management Association	6 %	6 %	6 %	16 %
Public Companies	6 %	11 %	10 %	19 %
Municipal Enterprise	22 %	21 %	20 %	14 %
Public-Private Partnership	20 %	28 %	29 %	25 %
Other Arrangements under Private Law	4 %	2 %	3,5 %	6 %

Source: BGW, BDEW

Within the wastewater sector semi-autonomous municipal agencies and inter-municipal agencies/water management associations dominate, with the formers' share increasing from 30% to almost 36% in the time period from 1997 to 2005 and the latter's from 4% to 28% (measured in population served). Still important, however, is the municipal department with almost 15% of population served, although in 1997 this was by far the most important organizational arrangement with 44% market share (see table 3).

Table 3: Organizational arrangements in the German wastewater management
(% of population served)

	1997	2002	2003	2005
Municipal Department	44 %	23 %	20 %	15 %
Semi-Autonomous Municipal Agency	30 %	43 %	43 %	36 %
Public Law Incorporation	14 %	16 %	17 %	17 %
Inter-Municipal Agency/ Water Management Association	4 %	13 %	12,5 %	28 %
Arrangements under Private Law	8 %	5 %	7,5 %	4 %

Source: DWA/BGW

Although there was a remarkably structural change in the organizational arrangements of water supply and wastewater services, public property at the enterprises is however further prevailing. Even if the legal form of companies was changed from public law to private law, the municipalities remained the owners of the new firms under private law, holding at least a 50.1 percent majority. This strategy is known as "formal privatization". A real "material privatization", where all assets of formerly public companies are sold to private firms, can be found for the water sector in table 1 under the item "other arrangements under private law" and for the wastewater sector in table 2 under the item "arrangements under private law". The corresponding shares are 6% of really privatized firms in the water supply and 4% in the wastewater services. The share of the real "material privatization", where all assets of the formerly public companies are sold to private firms, was even declining in the wastewater management during the period from 1997 to 2005.

4. WATER DEMAND AND SUPPLY

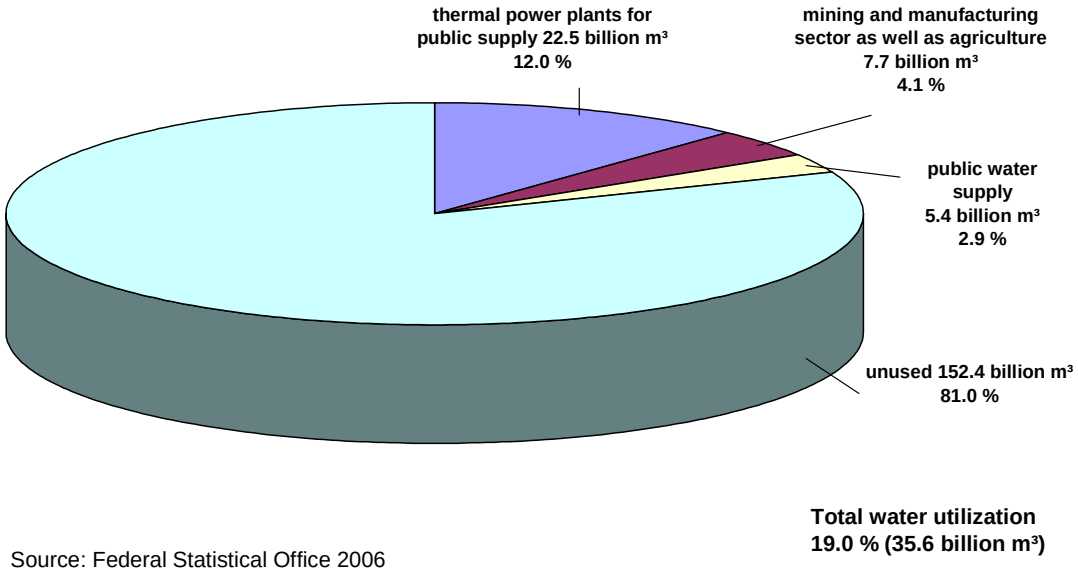
4.1 Availability of resources

Water in Germany is abundant. The total annual water reserve amounts to 188 billion m^3. Only 19 percent of these resources are actually used by the different users. The water utilities use 5.4 billion m^3 per year, which accounts for only 2.9

percent of the available resources. 22 billion m^3 or 12 percent go to thermal power plants for public supply and 7.7 billion m^3 or 4.1 percent to mining and manufacturing. More than 152 billion m^3 or 81 percent of all resources remain unused (see figure 1).

Figure 1

Water use in Germany 2004
Total available water resources: 188 billion cubic metres



Source: Federal Statistical Office 2006

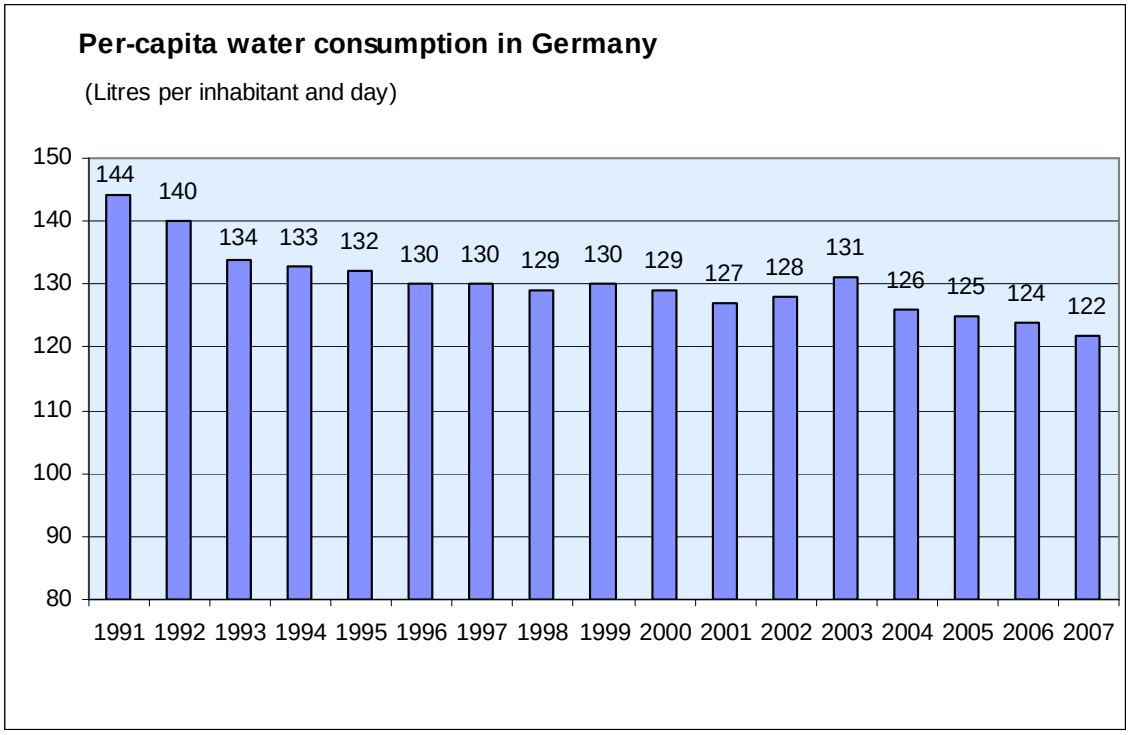
With a share of 65 percent, groundwater is the most important resource for drinking water abstraction. Another 9 percent of water abstraction in public water supply is springwater and 26 percent come from surface water. From 1990 to 2004, the water delivery volume of the public water supply has declined from almost 6 to 4.7 billion m^3, i.e. by approximately 22 percent.

4.2 Water consumption

Per-capita water consumption in Germany has declined by approximately 15 percent since the early 1990ies and currently amounts to 122 litres per inhabitant and day (see figure 2). Industry is extracting most of its water out of its own wells and reservoirs and is widely independent of the public water supply. 57 percent of total water use is for energy utilities, especially for cooling, 20 percent is for industrial purposes and 8 percent is for private households. Irrigation in agriculture plays only a minor role as the precipitation is sufficient.

The volume of water delivery by water utilities to industry has continuously decreased during the last two centuries. The main reason is that industry is to a high degree self-supplying and uses surface water for cooling or treated groundwater for industrial processes.

Figure 2



Source: BDEW Water Statistics, Federal Statistical Office

4.3 Supply of water and wastewater services

4.3.1 Principles of pricing and charging

The calculation of water prices and wastewater charges is subject to strict statutory regulation. The public water supply and wastewater utilities are subject to the Municipal Charges Acts of the federal states as well as to municipal supervision. Private water and waste water companies that charge their services directly to the consumers are subject to the supervision of the antitrust agencies. According to the Municipal Charges Act, water and wastewater utilities in Germany are legally bound to comply with the principles of cost-covering and equivalence in accordance with charges law, whose consideration in the form of price-performance comparisons can be examined by the municipal supervisory authorities. Therefore, the water supply companies are in a “quasi competition” as three out of four companies raise public charges in accordance with the Municipal Charges Law; these must be approved by local governments under the supervision

of the federal states. The remaining quarter of the providers raises payments under private law and is subordinate to the anti-trust control of abusive practices. The anti-trust price control is oriented to the comparative market concepts and accepts price differences between providers on the strength of clearly defined criteria only. Performance comparisons between the various bidders are undertaken by the municipal operators themselves by voluntary benchmarking.

Wastewater charges can be levied either in the form of a sewage charge based upon the freshwater consumed and an additional precipitation charge based on the drained area (split wastewater charges) or on an uniform charge according to the freshwater standard using the volume of freshwater consumed as an assessment basis. The costs for the collection and treatment of precipitation water are included in this uniform charge on a pro-rata basis.

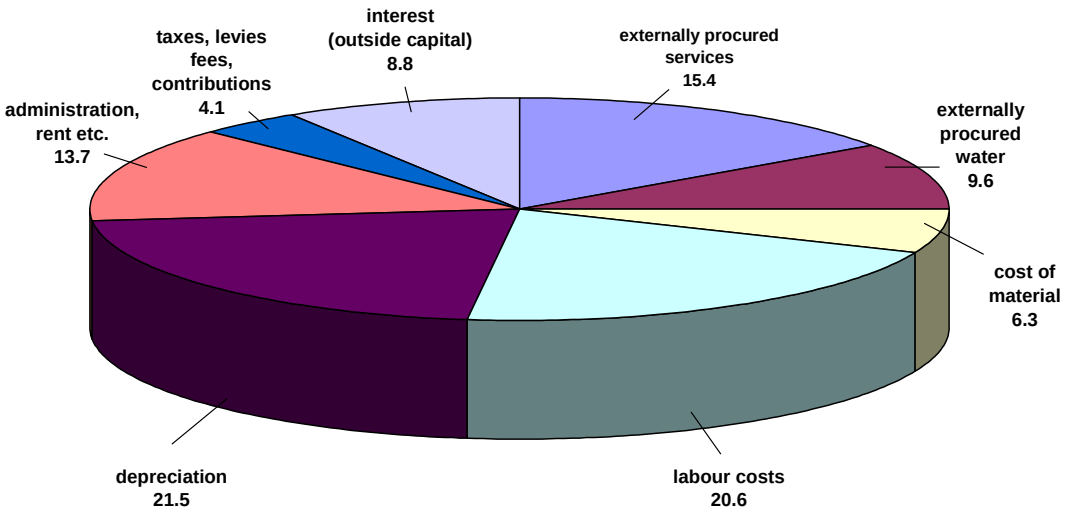
The fiscal outline for the water industry in Germany depends on the kind of service and the ownership. In the water supply, a reduced turnover tax rate of currently 7 percent uniformly applies to all forms of business organizations. In addition, there is an obligation to pay corporate income tax and in principle also trade tax. In wastewater management, organisations under public law are not subject to corporate income tax, trade tax and value added tax. However, if the wastewater management is organized by a company under private law, it is taxable under the provisions applicable to it, amongst other things with a turnover tax rate of currently 19 percent.

4.3.2 Cost structure in water supply and wastewater management

Water supply and sewage treatment are characterized by high capital intensity. Therefore, the share of fixed costs amounts to more than 70 percent. This includes fixed costs for operation and maintenance of the facilities. For that reason, maintenance and personnel costs depend only to a small extent on the operating performance. As shown in figure 3, labour costs have only a share of 20.6 percent of total costs. 21.5 percent of costs is for depreciation, 8.8 percent for interest, 15.4 percent for externally procured services and 13.7 percent for administration. Only a few costs are volume-dependant as externally procured water with 9.6 percent, costs of material with 15.4 percent or taxes, levies, fees and contribution with 4.1 percent cost share. In many municipalities, concession fees have to be paid by the water utility to the municipality which have to be earned by means of the water prices.

Figure 3

Cost structure in the water supply in 2004
Shares in percent



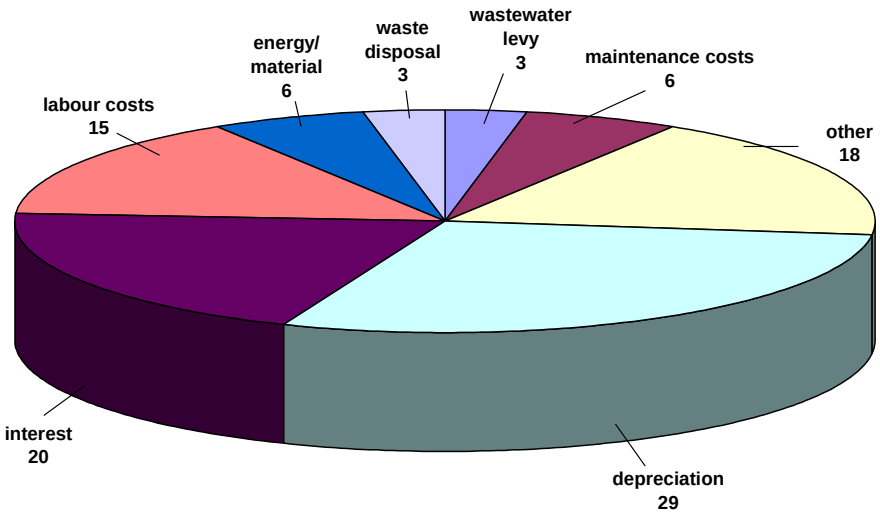
Source: Federal Statistical Office 2006

In sewage treatment, even 29 percent of total costs are for depreciation and 20 percent for interest. Only 15 percent are labour costs and 6 percent maintenance costs (see figure 4).

Figure 4

7

Cost structure in the wastewater treatment in 2005
Shares in percent



Source: BDEW / DWA economic data of wastewater disposal in 2005

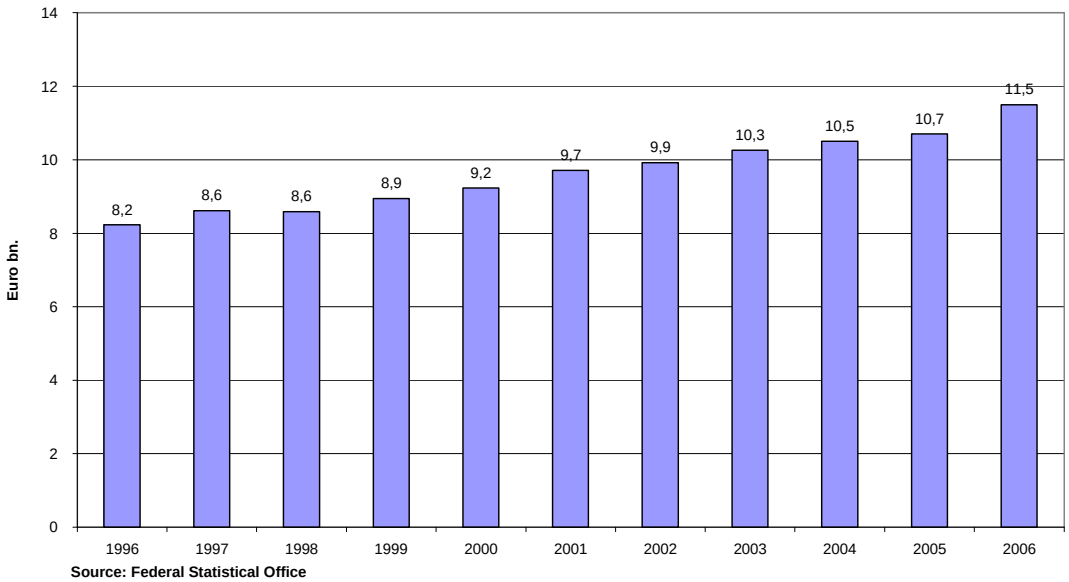
5. THE SIZE OF THE GERMAN WATER SECTOR: TURNOVER, EMPLOYMENT AND INVESTMENT

Information on turnover can be gained from the statistics on value added taxes, although the picture remains incomplete, as different tax rates are applied to the different activities. Water supply, either publicly or privately organized, is subject to the reduced value added tax which is also raised on food (7 percent), for example. The taxation of waste water management, in contrary, depends on ownership. If a sewage company is privately owned, it has to pay the full value added tax rate of 19 percent, if it is publicly owned, the tax rate is zero. That is the reason why only the turnover of private wastewater companies appears in the official statistics and the total turnover of public wastewater utilities remains unknown.

As shown in figure 5, turnover of water supply and private wastewater management utilities increased continuously from € 8.2 billion in 1996 to € 11.5 billion in 2006. The number of water supply companies increased from 3,714 to 4,297 at the same time. The number of private waste water companies increased from 700 to 831, but the majority of public waste water utilities are not considered. Turnover of private wastewater companies was about € 1 billion during the years 1999 – 2006 and for the public waste water companies, the German association of municipal enterprises (Verband Kommunaler Unternehmen VKU) estimates a total turnover of € 2.1 billion in 2003. So, the total market size of the German water and wastewater sector can be estimated on around € 14 billion for the year 2006.

Figure 5

Turnover in the German water supply and wastewater management

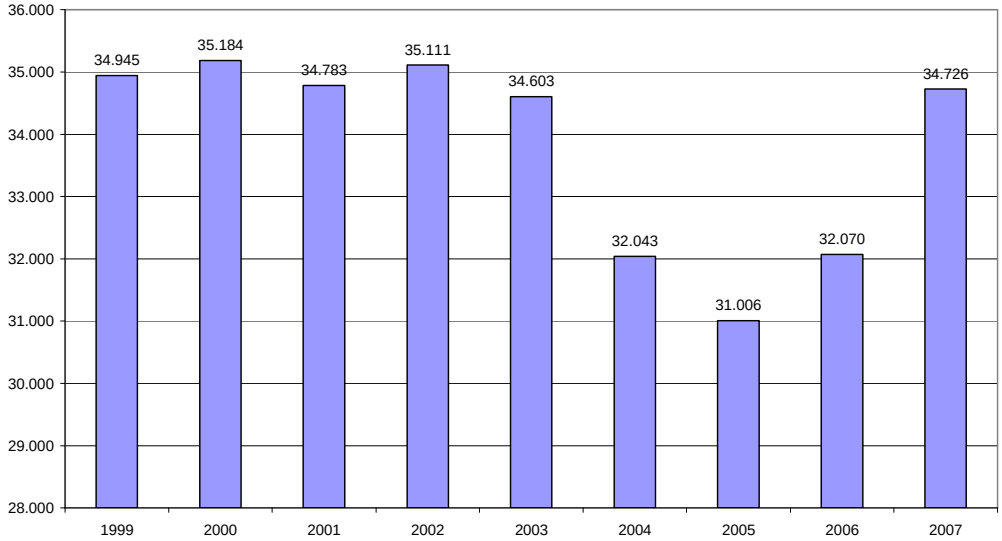


Source: Federal Statistical Office

The moderate turnover growth since 1996 was accompanied by a simultaneous decrease of employment in the water supply sector until the year 2005. As the statistics of the Federal Employment Agency show, the number of jobs in water supply companies varied around 35,000 during the years 1999 to 2002, afterwards decreasing rapidly to 34,600 in 2003 and 32,043 in 2004. During the following years employment increased again, reaching 32,070 in 2006 and 34,726 in 2007, which was almost the level of 1999 (see figure 6). Employment in wastewater companies is well-known only for two years. There were 19,704 jobs in 2003 and 21,048 in 2004, but it remains unclear whether there is a long-termed trend behind these numbers. Total employment in water and sewage utilities can be estimated on around 55.000 jobs.

Figure 6

Employment in water supply utilities in Germany

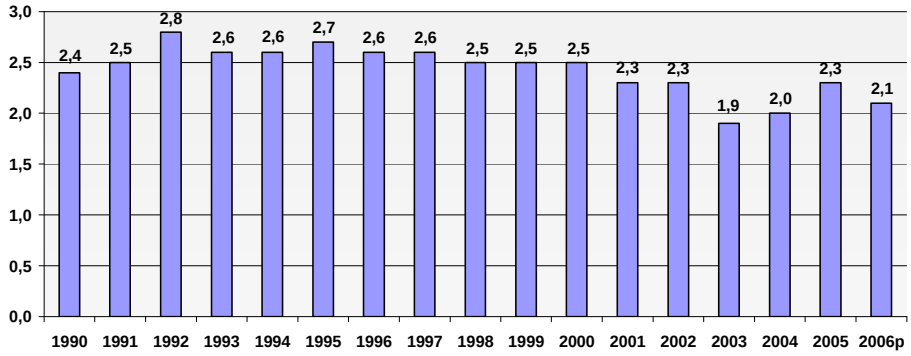


Source: Federal Labour Agency

Continuous investments into infrastructure, maintenance and renewal are a decisive factor for the long-term security of water supply and wastewater management. There was a continuously high investment in public water supply of around € 2.5 billion p.a. during the 1990ies and about € 2 billion p.a. in the first half of this century, as shown in figure 7. From this amount, an average of approximately 65 percent flows into the distribution networks and approximately 10 percent each into abstraction and treatment.

Figure 7

Development of investment into the public water supply from 1990 to 2006
in billion Euro

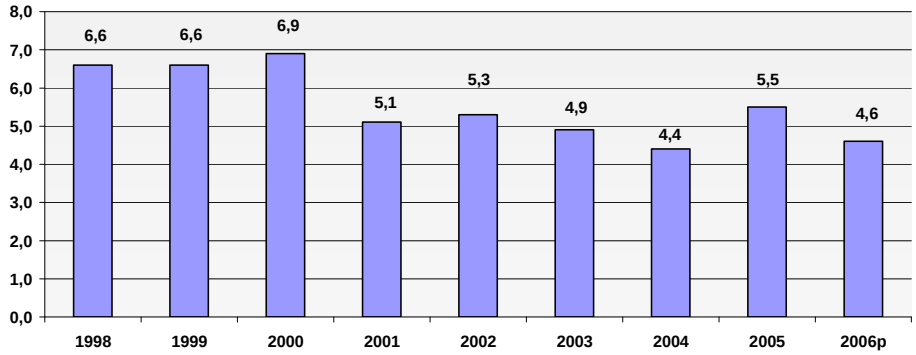


Source: BDEW Water Statistics; p= provisional

With approximately € 5 billion, also the wastewater sector has invested at a high level for many years (see figure 8). The decline compared to the years before 2000 is due to the phasing-out of investments within the implementation of the EU Directive on Urban Wastewater Treatment.

Figure 8

Development of investment into the public wastewater treatment from 1998 to 2006
in billion Euro



Source: BDEW/DWA wastewater survey; p= provisional

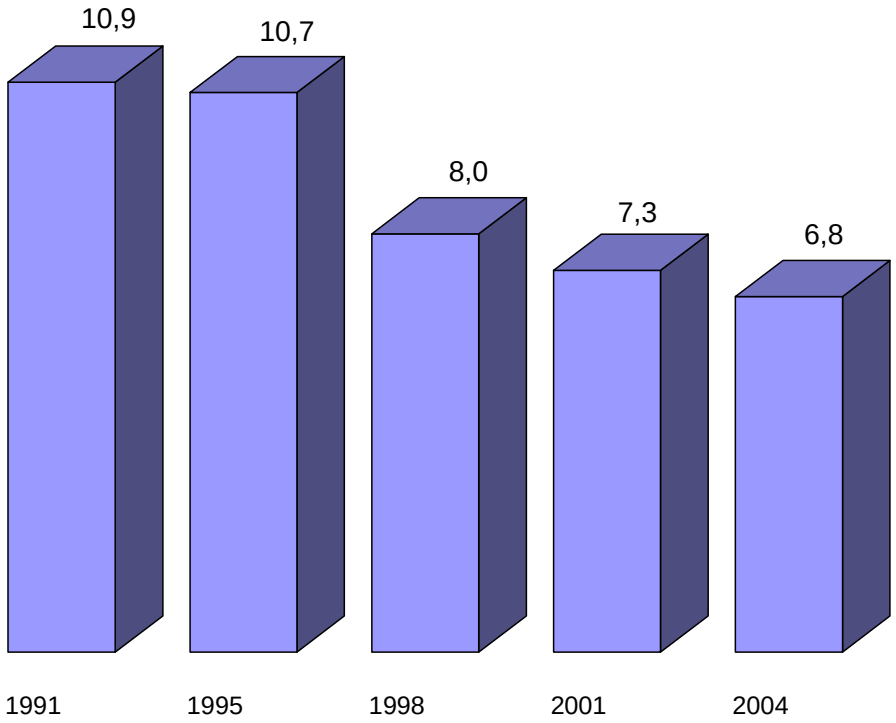
6. QUALITY OF SERVICES, PRICES AND CONSUMER SATISFACTION

6.1 Water losses

As already mentioned, there was a controversial debate about the advantages and disadvantages of a liberalization of the German water sector and a privatization of the water utilities. On the one hand there was the opinion, that competition and private ownership would encourage efficiency gains and price reductions for tap water, on the other hand it was argued that public ownership of water utilities implies higher environmental standards and a higher drinking water quality than private ownership does. In this context, leakage is often regarded as an indicator for the quality of drinking water. The idea behind it is that a company which worries itself about the losses of water worries also about the quality of the water. With an average of 6.8 percent in 2004, water losses declined since 1991 by 38 percent (see figure 9). With this, the German water supply has by far the lowest leakage rate in Europe, a fact which clearly supports the opponents of privatization.

Figure 9

Water losses in Germany
Data in percent of total delivery volume of drinking water



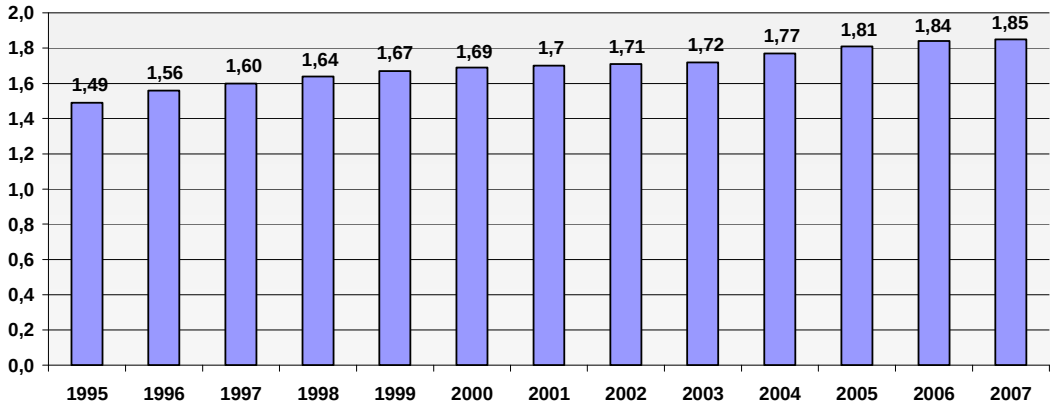
Source: Federal Statistical Office

6.2 Water prices and wastewater charges

In the average of all German water suppliers, customers have to pay a water price of € 1.85 per cubic metre of drinking water (see figure 10). In 2005, drinking water prices have increased by an average of 2.3 percent. This increase was for the second time above the average price increase of 1.6 percent. In 2006, price increase in water services was reduced to 1.7 percent and in 2007 to only 0.5 percent, which was far below the average general price increase. Consumers pay less than 0.2 Cent per litre of drinking water. Each citizen pays about 23 Cent per day for his average drinking water consumption (125 litres). This implies total costs for drinking water of € 7 per month, respectively € 84 per year in average. The average wastewater charge was 35 Cent daily, € 10.75 per month or € 129 per year in 2005. In 2005, wastewater charges increased by 1.4 percent as compared to the preceding years. In total, the costs of water supply and sewage services amounted to € 213 per year for the average customer. Because this water bill can be regarded as affordable, there seems to be no need for privatization because of the level of water prices.

Figure 10

Development of drinking water prices from 1995 to 2007
Average prices for households in Germany in Euro per cubic metre



Source: BDEW/BDEW Water Tariff Statistics of 1 January of the respective year, incl. base price and VAT

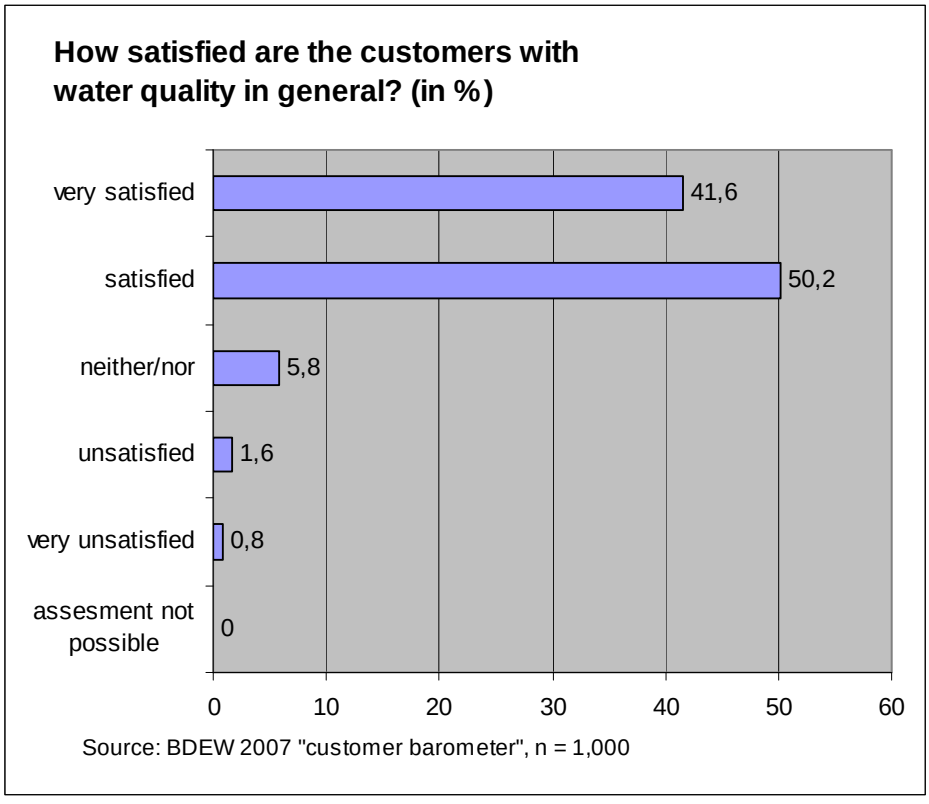
6.3 Costumer Satisfaction

Given the high quality of tap water it is no surprise that customer satisfaction with the public water supply is rather high in Germany. In 2007, the customers were interviewed for the third time nationwide and representatively about water supply. As result, the drinking water quality is given good to very good marks by the customers. Approximately 92 percent of the German customers are “very satisfied” or “satisfied” with the drinking water quality and only 2.4 percent were “unsatisfied” or “very unsatisfied” (see figure 11).

Also the organization of wastewater management shows high standards. In Germany, 90 percent of the population is connected to municipal waste water treatment plants with the highest EU-standard (biological treatment with nutrient elimination, i.e. third purification stage pursuant to the EC Directive on Urban Wastewater Treatment).

Figure 11

Customer satisfaction level with water quality



7. Summary and Conclusions

Compared to other countries, the German water sector is still very fragmented and small-scaled. This makes it very difficult on foreign markets to catch up with the global players which have a total turnover that is twice as high as the whole German market for water and wastewater services. To solve these problems, the German government promotes a modernization strategy which is based on closer co-operation between water and wastewater companies, outsourcing, identification of synergies between water supply and waste water treatment, benchmarking and public-private partnership. This modernization strategy seems to be promising for the improvement of the efficiency and competitiveness of the German water sector. However, fiscal privileges for public wastewater companies as well as the recognizable tendency for the bulkheading of communal structures are counter productive. On the foreign markets for water services a stronger political support of the German water management would be desirable.

In Germany, privatization of the water supply is neither linked with direct competition between municipal institutions for the market nor with an obligatory yardstick competition. The water supply companies are in a “quasi competition” as three out of four companies raise public charges in accordance with the Municipal Charges Law; these must be approved by local governments under the supervision of the federal states. Here, attention is to be paid to the principles of cost-covering and equivalence in accordance with charges law, whose consideration in the form of price-performance comparisons can be examined by the municipal supervisory authorities. The remaining quarter of the providers raises payments under private law and is subordinate to the anti-trust control of abusive practices. The anti-trust price control is oriented to the comparative market concepts and accepts price differences between providers on the strength of clearly defined criteria only. Performance comparisons between the various bidders are undertaken by the municipal operators themselves by voluntary benchmarking.

Water management competence in Germany is clearly located at the municipal level, which admittedly restricts international competitiveness. An important advantage of the structures in the German water supply is that the strong communal anchoring of the German providers ensures a high degree of political involvement. This system enjoys strong acceptance amongst the population because of the high quality of drinking water and the moderate prices for water and wastewater services. The high level and the efficiency in the technical management are guaranteed through the close co-operation between water supply companies, industry, government agencies as well as through the activities of technical-scientific associations which set the rules. However, the influence of the German water industry on the decision processes in the European Union is rather small, due

to the strong functional and organizational fragmentation. Through the strong division of organizational competence (water supply and wastewater disposal companies, construction firms, plant constructors, component suppliers, consulting firms, engineer offices, water laboratories and research institutes) the integrated appearance on the international market is missing in the German water industry.

The water supply is still organized as a regional monopoly, be it public, private or semi-private. Although the German water sector is an exception area in terms of competition law, structural changes in the German water sector took place with respect to the organizational forms. Public utilities that were organized as municipal departments in former times were transferred into more independent organizations: Within the wastewater sector semi-autonomous municipal agencies and inter-municipal agencies dominate; in the water supply sector against it the municipal enterprise (in shape of the formal privatization) and public-private partnership models are the most important organizational arrangements. Public property at the enterprises is however further prevailing.

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Université de Liège au Sart-Tilman
Bât. B33 - bte 6
BE-4000 Liège (Belgium)

Tel. : +32 (0)4 366 27 46
Fax : +32 (0)4 366 29 58
E-mail : ciriec@ulg.ac.be
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