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## Article

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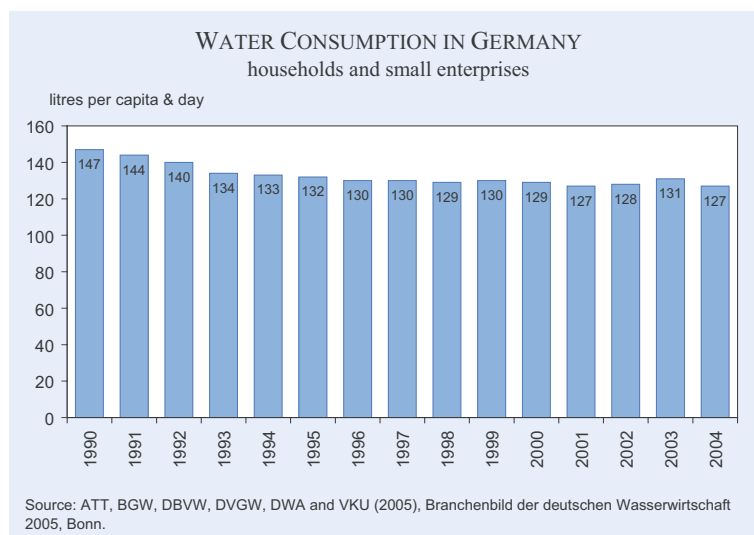
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## REGULATION OF WATER SUPPLY IN GERMANY

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Germany has a very good record on water services. Despite very good levels of service, high connection rates and almost full cost recovery, the total annual costs for consumers (as measured in annual bills or invoices) are nonetheless at the same level or even cheaper than in other countries such as France or the United Kingdom. This is an outcome of the specific way in which water supply and to a lesser degree sanitation are organised and regulated in Germany, where municipal self-government is combined with competition. This contribution endeavours to explain the practice of municipal enterprise embedded in Germany's federal structures, the levels of water services, and reveals why water services can be as good and cheap as they are. It does not provide an answer to the question it begs: "Why is the strength of the German approach not more appreciated in international water policy debates?"

Figure 1



However, the contribution does highlight some of the difficulties Germany experiences with respect to its international presence.

### Effective source protection

On the whole, Germany has sufficient water for all uses. Water stress is rare, and when it occurs, it is seasonal and regional in scope. Some areas with historically high water consumption linked to industry, such as in the industrialised mining region between the rivers Ruhr and Lippe in the Rhenish coal-mining district, and the regions around Stuttgart, Bremen, Frankfurt, Halle and Leipzig, are supplied by long-distance or inter-basin transfers.

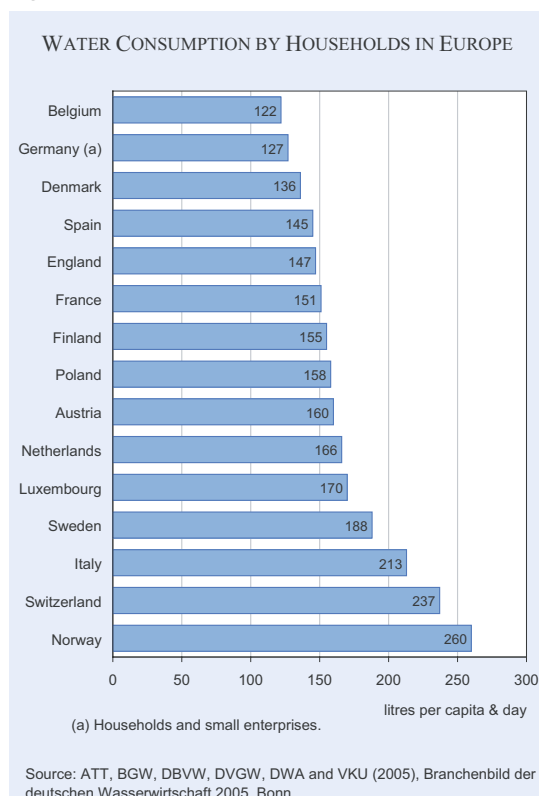
Water pollution control and source protection are relatively effective, and Germany has diversified its water sourcing, using naturally protected groundwater where possible, spring water and groundwater from infiltration, or surface water. There are deficits in controlling pollution by nutrients, pesticides and their metabolites from agriculture, and from ubiquitous small-scale sources of pollution in urban areas, which will need to be addressed to maintain the current security and affordability of water supply also in the future.

Water suppliers often contract with land-owners and land-users, particularly in agriculture, to ensure that land use and agricultural methods do not compromise the protection of water sources. This can involve management contracts or the purchase of agricultural land by water suppliers and its lease back to farmers with management conditions, favouring organic farming and other low-im-

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Figure 2



fact methods. Recognising the clear efficiency advantages, regulators have allowed German water suppliers to pass on to water consumers the costs of compensating farmers for the required changes in management practices. In violation of the polluter-pays principle, the water users, through the water price, pay the polluter or potential polluter for practicing non-polluting or low-polluting methods. This is done in the interest of efficiency, because it is much more costly to treat and clean the drinking water than to pay to reduce pollution at its origin. Political economy also suggests that a pragmatic solution in the water sector is easier to obtain through direct negotiations with individual farmers or land-holders rather than by trying to reform the European Union's Common Agricultural Policy to make it ecologically sustainable.

### Low water consumption and high levels of service

There is spare capacity in most of the supply infrastructure as a consequence of falling water demand, driven down not only by industrial modernisation and improved process control but also, at least in part, by economic instruments: cost-covering water prices and water abstraction taxes or charges reflecting external costs of water use. It can be said that

water use has reached the "bottom level", which becomes clear when looking at the development shown in Figure 1, as well as when assessing the emerging technical difficulties resulting from low water use. In some distribution systems, water throughput is so low that it can cause quality problems where water begins to stagnate in pipes (or to foul in sewers). At the same time, peak demand and emergency fire-fighting flow requirements have not decreased.

Water consumption in Germany, with 127 litres per capita per day (including water use in small enterprises but not industry), is low in comparison to household water consumption alone in other industrialised countries, as shown in Figure 2. This means that the cost of water supply, including the fixed cost for the capital-intensive and long-lasting network infrastructure with sufficient capacity for fire-fighting, has to be borne by relatively few cubic meters of water sold. International comparisons of water prices, which are normally based on assumed standard water consumption – of 40 m<sup>3</sup> per person or 120 m<sup>3</sup> per household for instance – or on the price per m<sup>3</sup> in one or a few cities, regularly ignore this fact.

Overall, consumers in Germany demand and obtain water with high levels of supply security and water quality. The water supply infrastructure reaches practically 100 percent of the population and is of high technical standard. Interruptions in supply are rare, and leakage rates<sup>1</sup> and the use of chemicals in water treatment are comparatively low. Because of the naturally pure water sources, the water supplied in Germany is generally of very good quality, often better than prescribed in WHO standards and EU legislation. In addition, water is delivered continuously and in sufficient quantity. Similar high levels of performance are attained in sewerage.<sup>2</sup>

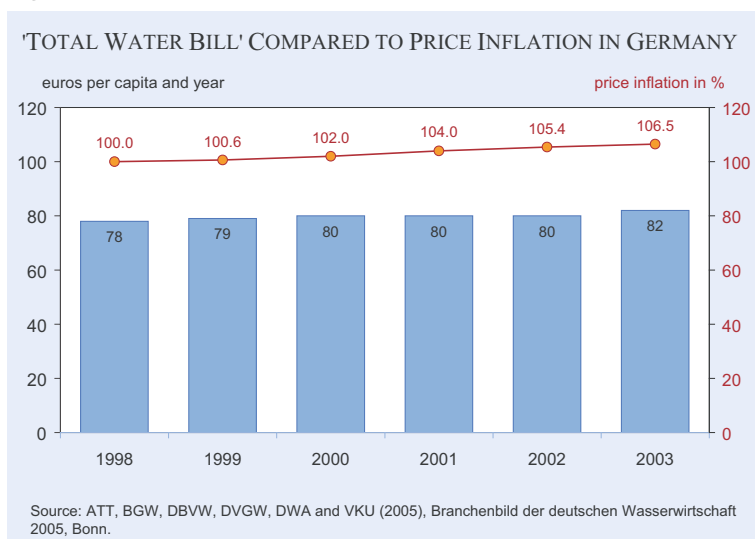
### Investment in water services and total costs to consumers below 1 percent of GDP

The total investment in water services is about EUR 8 thousand million per annum, and a similar amount is also spent on operation and maintenance. The total amounts to more than EUR 16 thousand million or approximately EUR 200 per capita per annum, which

<sup>1</sup> Leakage is 7.3 percent in Germany, low compared to England & Wales (19.2 percent) and France (26.4 percent).

<sup>2</sup> In sewerage, 94.6 percent of the population in Germany was connected to sewerage systems in 2001, and 96 percent of these connected to tertiary treatment.

Figure 3



is under 1 percent of Gross Domestic Product per capita. Using a different approach, Wackerbauer (2007) estimates the total turnover or revenue of the water sector in 2003 at 14 thousand million.

Figures 3 and 4 illustrate the evolution of the annual bill or invoice in euros (scale on the left) per capita for both water supply (Figure 3) and sewerage (Figure 4) from 1998 to 2003. Both figures show that the cost to consumers is in line or below general price inflation (scale on the right).

At the level of annual costs per capita shown, which has remained essentially stable for a decade, sewerage charges recover 93 to 95 percent of cost. Water prices recover over 100 percent, because of water abstraction taxes and municipal concession fees. The latter can be levied by municipalities on water sup-

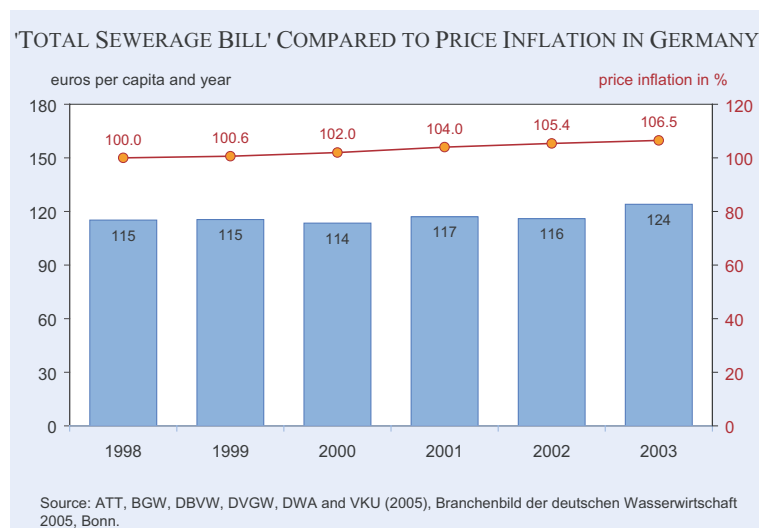
ply undertakings for the use of public property for the water infrastructure.

### The source of success: organisation and regulation of water supply (and sewerage)

It should be said at the outset that the term “regulation” (or “Regulierung”) – in the economic sense of supervising and determining tariffs and prices, rates of return, investment, conditions of access, etc. – is not normally used in Germany, although this is changing slowly in response to

recent changes in the economics and regulation of other sectors such as electricity or telephony. The reason is that the (state or federal) government is commonly meant to regulate, and that the regulated utilities are normally assumed to be private, for-profit businesses. In Germany, however, responsibility for the provision of water services lies with municipalities. They are neither private entities nor (part of the) state in the usual sense of the term “state”; they are neither “emanations” (or creations) of the state, nor subdivisions of or subordinated to the states (or Länder) in Germany. They have their own democratic legitimacy and autonomy in self-government, guaranteed by the German constitution or “basic law”. In their sphere of competence, municipal governments are primarily responsible for providing the basic needs for the existence, social development and economic activity of their inhabitants and voters.<sup>3</sup>

Figure 4



Government authorities and agencies at the state and federal levels set the legal framework for water services, usually transposing EU legislation, thus influencing general conditions of water services, water prices (e.g., principle of cost recovery)<sup>4</sup>, wa-

<sup>3</sup> This is captured in the term “Da-seinsvorsorge”, literally “providing for existence”.

<sup>4</sup> In Germany, water prices and sewerage charges must in principle cover all costs, including: water resource protection, abstraction, and purification; transfer where necessary, storage, and distribution; collection of waste and rain water, and sewage treatment, discharge and environmental measures.

**Organisation of water supply in Germany, 2005**  
in % weighted by water quantities

Organisational arrangement	Total	Public law	Private law
Direct labour	0.4	0.4	
Municipal agencies	14.9	14.9	
Municipal associations	15.9	15.9	
Water & Land Management Association	6.3	6.3	
Municipal enterprise	19.9		19.9
Public enterprise	10.3		10.3
Public-private companies	28.8		28.8
Other private undertakings	3.5		3.5
Total	100.0	37.5	62.5

Source: Wackerbauer (2007).

ter quality (e.g., limit values), water abstraction (e.g., permitting requirements and conformity with environmental objectives), and environmental measures (e.g., the establishment of water protection zones around sources). Municipalities, on the other hand, have to decide on the institutional, organisational or contractual arrangements for the provision of water services.

In many small towns and municipalities consisting of several small villages, “direct labour”, i.e. the provisions of water supply (and sewerage) by municipal administration, still prevails. Weighted by the volume of water delivered, however, private-law forms of organisation prevail. Table 1 shows the relative importance of direct labour, the provision of water supply by a separate unit of municipal administration (agencies), associations established by municipalities and sometimes other public entities under public law. Together these forms account for less than 40 percent of water supply in Germany. The majority of water is delivered by undertakings established under private law, usually in the form of companies with limited liability (GmbH) or joint stock companies (AG). Municipal enterprises, owned by one municipality and public enterprises involving more than one public entity account for about 30 percent of water delivered and mixed public-private companies for almost 30 percent as well. Overall, the weight of private-law arrangements is over 60 percent.

Over the past decades, public-law undertakings have declined and private-law forms of organisation have increased in importance. Direct labour management, which was used in sewerage in particular, has given way to the establishment of separate municipal agencies and associations of several municipalities.

Overall, the trend towards stronger and more focused management units and towards associations of several municipalities has helped improve accounting and management. The same effect can be observed with a trend towards private-law undertakings, increasingly involving (minority) private partners or shareholders.<sup>5</sup> Overall, these trends have facilitated higher levels of professional management of water services, including financial management.

The resulting pluralistic structure of private and public law undertakings is still, and for the foreseeable future likely to remain, dominated by municipalities that are the sole or majority owners of assets and capital. About 100 companies deliver approximately 50 percent of water in Germany, and the size of the undertakings and the service areas largely match municipal boundaries or contiguous urban settlements. Economies of scope are exploited through associative structures, because of the nature of water supply and sewerage not at the technical but rather at the managerial level.

Many municipalities organise several public services in one undertaking, again to take advantage of economies of scope as well as economies of scale. Multi-utilities, even if they serve only one municipality, are large enough to offer appealing career prospects and to attract technical and managerial staff with competence and ambition. The combination of several services can help reduce costs, facilitate the management of liquidity and investment finance, and create synergies in urban development or renewal. The clear legal framework for management, including their legal personality, enables them to have direct access to loan finance and capital markets. It also allows for independent management in full accordance with the laws governing private-law businesses and the combination of effective and efficient management with strategic political oversight, without the risk of undue interference in operational management.

<sup>5</sup> Direct labour management and most municipal agencies do not enjoy legal standing or legal personality, the right of active passive litigation. All associative and private-law forms of management and have legal personality, which strengthens the position of management in all conflicts with water users and other stakeholders, including in planning and other political decision-making processes.



### **“Government regulation” balancing municipal autonomy**

The strong position of municipalities in the provision of water services in Germany is the result of the constitutional standing municipal self-government has had for the past 200 years, which is reinforced by the federal structure of the state and central government. Just as municipalities protect citizens and local affairs from interference by state governments, the federal states protect municipalities from interference by the central or federal government or the European Union. The practice of using private-law undertakings as well as the horizontal integration of public services in local multi-utilities has underpinned successful decentralised management at the local and regional level.

Primarily state (or *Länder*) governments set the framework for municipal management as described above, rather than regulating in the usual economic sense of the term. Governments also use general powers to “police” the behaviour of municipalities and their undertakings. For instance, state authorities observe and control the level of debt incurred or carried by municipalities. They intervene if levels of investment or debt finance arrangements threaten to overwhelm a municipality. This supervision includes all public-law municipal undertakings: Their tariffs and prices or charges must either be authorised or are subject to review and revision by state supervisors.

Private-law providers of water services, irrespective of their ownership, are subject to the supervision and disciplines concerning possible abuse of monopoly powers through the competent state authorities. Possible intervention is based on the comparative statistical analyses similar to those used in the economic regulation of prices or rates of return, even though the mode of intervention is different. Tariffs and prices do not need to be authorised by the state authorities, but can be reviewed and ordered to be revised (lowered) if an abuse of monopoly power is likely or proven. With the increasing importance of private capital participation in private-law water suppliers, such reviews will probably be more frequent in the future.

### **Multifarious competition keeps the water sector lean**

Water supply has a special position in German competition law. Certain types of contracts, which are

normally illegal, are allowed for water abstraction, transfer and distribution. These include demarcation agreements, usually between or among municipalities, limiting each party to a specified service area or area of supply; agreements with municipalities establishing exclusive rights for one water supply undertaking to use public grounds, effectively excluding other undertakings from operating in the area; price-fixing on a “most favoured customer” principle; and long-term exclusive partnerships for financing and sharing infrastructure. Such contracts are not automatically exempt from competition law, but must be passed on to the competition authorities, which can then assess them with respect of their benefit and necessity, proportionality, their effect on third party interests etc. The competition authorities can then disallow the contracts or ask for changes before allowing them. A third party, including new market entrants, whose interests may be affected, can challenge a contract that is allowed (or not disallowed) and trigger its review by the competition authorities.

In spite of this special treatment of water suppliers under competition rules, and the fact that many local monopolies do not compete with or challenge one another, the German water sector is still characterised by high levels of competition, which comes in various forms:

- The various organisational arrangements for water supply (and sewerage) compete with one another, with the most attractive being characterised by independence of management and legal personality of the undertaking;
- The performance of the undertakings, irrespective of legal form and ownership, are benchmarked against one-another in a process sometimes called “surrogate competition”. Benchmarking can be voluntary or carried out by competition authorities in a process that is similar to price or rate-of-return regulation;
- A similar type of competition occurs through the media and political processes, with journalists and (opposition) politicians comparing tariffs, prices and their changes in various towns, and bringing them to the attention of the public as consumers and voters;
- There are many small and medium-sized private-sector providers of water-related goods and services. Sector standards ensure the interoperability of components and help maintain high levels of competition in the “upstream” markets (There are no vertically integrated companies in the sector);

- An increasing number of engineering, construction, and plant management businesses also compete for delegation or concession contracts giving them – by agreement with a municipality – the exclusive temporary right to provide water services in a specified area;
- The professionals in the sector are in competition with one another for recognition by peers, as well as prestige and standing in the community. This form of competition is underpinned by an open and accessible knowledge base in technical, scientific and professional associations.

These various forms of competition co-exist and reinforce one another within the regulatory framework in Germany, where municipalities enter into the provision of water supply (and sewerage) and use their ownership of assets and capital to exert control over levels of services, tariffs and prices, investment and conditions of supply. The inhabitants of a supply area have their interests represented through elected local officials, and the local politics as well as media attention provide sufficient transparency and public pressure. This framework of “public control”, in combination with the various forms of competition, can be regarded as a “functional equivalent” to the concept of utility regulation, which assumes an antagonistic relationship between (state) regulator and (private, for profit) operator. As the international comparison with the levels of service, cost recovery rates, and total annual bills for water supply has shown, the German regulatory system is obviously effective.

#### **Why is the German mode of regulating water services still largely unknown?**

In spite of its evident domestic success, the German way to regulate water supply (and sewerage) is largely unknown outside of Germany. The reasons for this state of affairs cannot be fully explained, but there are a number of factors. One is the strict local orientation of water supply undertakings, which – as a rule – are prohibited from operating outside the territory of the municipality or municipalities that establish them, and the local service orientation of most of the professionals seeking a career in the sector. Another is the small and medium-sized structure not only of the utilities but also of the providers of water-related goods and services. Not having “national champions” in the sector may be good for competition at home but it is probably bad for a

strong presence in markets outside of Germany. It must also be said, however, that many of the upstream providers to utilities have considerable knowledge and technology, and are often leaders in their (narrow) field of expertise with high exports.

With most of the responsibility and competence for water supply and sewerage located at the sub-national and even municipal level in Germany, the sector has difficulties in co-operating with international development institutions, which focus on government-to-government co-operation. The German municipalities and water supply utilities might make important contributions for achieving the United Nations Millennium Development Goals in the field of water and sanitation, for instance by forming partnerships with towns and cities in other parts of the world. This may be because scale is deemed to be more important than replicability, or because the “institutional blueprint” of French law and industrial structure shapes the prevailing ideology in development policy, just as the Anglo-American concept of utility regulation shapes expectations in economic and regulatory policy. This may change as the efficiency of the German “regulatory systems” becomes more widely understood.

#### **Reference**

Wackerbauer, J. (2007), “Struktur- und Entwicklungsperspektiven der deutschen Wasserwirtschaft”, *ifo Schnelldienst* 60 (1), 14–25.