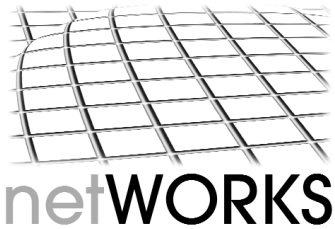

netWORKS - Papers

Number 1: Transformation Processes in Network Industries

Regulatory Requirements

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Imprint

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1. Introduction

The threatening decline in municipal infrastructure, a dramatic fall in public infrastructure investment, the privatisation of public utilities, and the introduction of competition in infrastructure markets are only a few aspects under discussion in the debate on the future of key local government services.

The precarious financial situation of German local authorities compounds all problems, providing the backdrop to current changes in local infrastructure sectors. At first glance, at least, local authorities appear to be reacting to the growing crisis with viable solutions. For instance, the privatisation of public utilities brings desperately needed income, and rids local authorities of future financial burdens.

However understandable this focus on the financing issue may be from the local authority point of view, municipal infrastructure problems are far more complex, and the long-established models for resolving them are unlikely to work in the future.

Developments are now often considered to constitute a shift in paradigm. New demands on infrastructure require changes in the political, legal, and institutional framework and in how these key economic sectors are handled. What new regulatory models are needed and how they are to be implemented in a context of forward-looking, sustainable infrastructure development at the local level?

Given the vital importance of the municipal infrastructure for the economy as a whole and the new, complex problems that have arisen, netWORKS is investigating the regulation of infrastructure at the local government level in an interdisciplinary approach. The project application describes the task as follows: “Network-related infrastructure systems, which are key elements in modern societies, are undergoing radical change, which can be regarded as socio-ecological transformation. Important drivers are liberalisation and the privatisation of (formerly) public functions. The core of the socio-ecological problem under study is the break up of the old public utility service structures and the lack of regulation for this transformation process. The research association aims, in collaboration with practitioners, to develop and test tools and strategies for regulatory intervention in the socio-ecological transformation process, particularly at the local government level, in order to guide it along a corridor of sustainable development, to keep options for formative action open, and to avoid exacerbating socio-ecological problems.”

Research is concentrating on future organisational structures and regulatory problems in municipal water management. The first phase of the project, however, is devoted to a comprehensive assessment of the current situation in the telecommunications, energy, public transport, and water sectors.[1] Whereas far-reaching liberalisation was implemented years ago in the telecoms and energy sectors, which have thus had a great deal of experience with the process, discussion on a future framework for the water and public transport sectors is far from over, and, at least in Germany, has received new impetus from European Union initiatives.

1 The appendix contains a complete list of the sectoral reports published by netWORKS as well as the “cross-sectional analysis” linking them.

On the basis of an analysis of current structures and liberalisation options in these sectors, assessment aims to identify future regulatory requirements and permit conclusions to be drawn about the future development of local water management. In considering the future of local government infrastructure policy, the water issue is a particularly apt example. In the water sector there is strong pressure for change, although the extent and direction of reform is apparent only in outline. But the discussion on water issues is often highly emotional, owing to the high demands society makes of the sector and the marked inertia displayed by stakeholders.

To ensure findings are approximately comparable, the sectoral analyses obey a certain classification structure. Sector-specific aspects have naturally prevented application of the structure in all cases.

This study seeks to establish what the sectors in question have in common and what differences there are between them, with the aim of advancing the debate on the future of local water management. In-depth analyses in the sectoral assessments are indicated by abbreviated names (Water, Energy, Public Transport, Telecoms) within the text.

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2. Infrastructure Development

The infrastructure sectors water, energy, telecommunications, and public transport differ necessarily from a technical and institutional point of view, but, in retrospective, certain fundamental cross-sectoral trends in their development are apparent.[2]

Historically, key infrastructure systems began to develop in the course of urbanisation. Functions performed by individuals (or by groupings of citizens such as well-cooperatives) were increasingly transferred to specialised organisations which assumed responsibility for utility services first and foremost within towns and cities. Initially, infrastructure systems were composed only of spatially isolated, unlinked subsystems (e.g., electricity supply, railways). At first, private companies begin to establish a utilities infrastructure, naturally limiting themselves to areas that could also be opened up economically. The consequent exclusion of whole social groups and regions from services, inadequate quality standards, and the lack of financial resources for developing comprehensive systems resulted sooner or later in the nationalisation or municipalisation of the infrastructure (Wysocki 1995, Kluge 2000, Kluge/Schramm 1986; Abrosius 1994).

2 See the summary overviews in the appendix.

⇨ WATER

The spatial extension of utility systems, the growing number of consumers connected to them, growing market penetration, and demand for more efficient services led to the "industrialisation" of infrastructure provision. Institutionally, this development manifested itself in the development of infrastructure enterprises, sometimes at the national level. Although various functions of service delivery were differentiated at an early date, for example wholesale trade/transmission (e.g. transmission networks) and delivery to the end user (secondary distribution networks), completely vertical integration was the rule for enterprises in all sectors.

For economic and technical reasons (natural monopolies), enterprises remained sole suppliers in their respective territories, safeguarding their position through statutory monopolies. This organisational model, widespread throughout the world until the late 1980s, was useful while developing and expanding infrastructure. Centrally coordinated planning, supplemented by a system of internal subsidies (between sectors and between user groups within individual sectors) permitted the rapid, comprehensive development of infrastructure or at least the maintenance of infrastructure systems that could not be operated cost effectively. This phase of infrastructure development was also favoured by fundamentally stable underlying conditions. The demand for infrastructure services grew steadily, so that long-term supply-side strategies were not a great entrepreneurial risk for companies. This planning security provided by stable institutional conditions and market developments was also enhanced by the fact that no technological leaps in the infrastructure sectors in question took place for long periods, which would have jeopardized the sectors' organisational structures and economic basis.

More or less to compensate for the statutory protection afforded them as monopolies, both national and local infrastructure enterprises were put at the service of more comprehensive economic and societal objectives. Labour-market, welfare, and environmental tasks and requirements, although raising productions costs, were nevertheless no problem for such enterprises in so far as they could pass on these additional burdens to the consumer relatively easily through pricing. The financing of key political tasks through charges and rates instead of taxes was the rule in this system of publicly-owned statutory monopolies.

However, the infrastructure-oriented corporate structures that developed in the course of history proved problematic when companies faced new challenges requiring a transition from supply-side to demand-side strategies. Within their old corporate structures, enterprises generally reacted very ponderously, and they usually showed little willingness to accept change or adapt to new framework conditions. The introduction of new services and products proved a difficult undertaking, because the integrated structure of enterprises required all components of the system to be changed at the same time. Given a lack of competitive pressure and inadequate incentive systems, public enterprises could often justifiably be reproached with inefficiency.

⇨ ENERGY & WATER

In recent years, however, lasting changes in the demand for infrastructure services and in key supply-side conditions have focussed critical scrutiny on this traditional infrastructure model, which has increasingly been supplanted by new organisational models. New corporate structures and a different sectoral regulatory framework, new financing models, and rather short-term business models are characteristic of this new image of infrastructure sectors.

The various sectors have accepted the new infrastructure model in widely differing degrees, but experience has shown that the systems have generally become much more complex. This raises the question whether regulatory intervention is still possible and what new instrumental and institutional challenges the future will pose for the control of these sectors.

3. New Challenges in Planning and Organising Infrastructure

In all industrial countries, this traditional model of infrastructure provision has come under pressure in recent years (Kessides 2003, European Commission Community Research 2003, European Commission 1999, Henry et al. 2001, WRc & Ecologic 2002). For politico-institutional and cultural reasons, the background to the necessary reforms and their implementation naturally differ, but from the sectoral point of view certain decisive driving forces can be identified at the European level.

Table 1: Forces Driving Liberalisation in Network Industries*

	Technical develop-ment	**Changing demand**	**Deficient public enterprises**	**Potential competitors**	**EU internal market rules**
Telecoms (industry)	X	X			X
Aviation				X	X
Telecoms (households)	X	X			X
Electricity			X	X	X
Gas				X	X
Railways		X	X		X
Water			X	X	

*Source: Based on European Community Research 2003, Van Noord 2001.

Compared with many other European countries, the local government level in Germany has traditionally played an important role in infrastructure policy. Regardless of global trends in network industries, direct economic constraints at the local level will therefore be

the prime determinants in shaping the local infrastructure of the future. Although the privatisation of municipal enterprises is not infrequently justified in terms of regulative policy, the main reason is clearly the revenue that divestment generates.

3.1 Dramatic Local Government Financial Problems

The financial situation of local authorities has deteriorated dramatically in recent years. More and more towns and cities face insolvency, and even well managed municipalities in prospering regions face unprecedented financial problems. These straits are caused by higher, crisis-induced spending, especially on social welfare, and by lower income owing to tax cuts and a spectacular decline in trade tax revenue.[3] The latest tax revenue forecasts offer little hope of improvement (Karrenberg 2003). One consequence of the financial crisis with a lasting impact on local development is the dramatic and accelerating fall in local government investment. In 2001 total local authority investment was € 11 billion (33 %) lower than in 1992.

The federal government has meanwhile agreed on a compromise for reforming local government finance. In 2004 the reform package is intended to ease the burden on municipalities by about € 4.5 billion, and from 2005 by an annual € 5 billion. This sounds considerable, but it is doubtful whether the compromise is a viable solution for the long term. Part of the relief offered local authorities is at the cost of federal and state financing leeway. And the reform does not solve the underlying problem, namely the dependence of local finances on the development of the economy.[4]

3.2 Continued High Demand for Infrastructure

Local government financial problems are matched by growing investment needs. A Difu study on the development of local authority investment requirements in the coming years concluded that there can be no question of “saturation” in the field of local infrastructure (Reidenbach 2002). For the period 2000-2009, Difu estimates investment requirements at about € 686 billion. Almost two-thirds of this amount is needed to replace and modernise the infrastructure. By comparison, local government spending on fixed assets in 2002 amounted to some € 22.5 billion.

⇨ WATER

Future capital spending in this area is needed particularly because of the age structure of infrastructure – particularly water and sewerage systems – investment that is difficult for

3 Cf. Karrenberg/Münstermann 2002; see also the copious information provided by the German Association of Cities and Towns (http://www.staedtetag.de) and the German Association of Towns and Municipalities (http://www.dstgb.de).

4 The reform models discussed in this connection cannot be dealt with in detail at this juncture. See Arbeit/Friedrich/Wegener 2003; BDI/VCI 2001, etc.

many local authorities to finance owing to a lack of reserves.[5] This is despite the development of new financing models, which, although legal, are eyed with suspicion – not only by the public – and provoke corresponding opposition.[6]

3.3 Shift in the Focus of Investment

Already in the medium term, demographic developments will affect infrastructure utilization levels – and not only in East Germany, as has so far been the case (Bullinger 2002; Klatt/Meyer 2002). Because of the considerable block of fixed costs, the sharp decline in demand will mean that the remaining customers will have to bear heavier charges, thus generating social fractures. Contractionary processes may also concentrate spatially within supply areas, which could affect the stability and good functioning of the entire network (Moss 2003). In many places, these problems are also compounded by concomitant, spatially differentiated developments, i.e., the depopulation of core cities and often uncurbed suburbanisation with the development of new consumption focal points on the periphery of conurbations.

⇨ PUBLIC TRANSPORT

The new challenges facing local infrastructure policy can, however, not simply be reduced to questions of finance. Current financial problems tend to superimpose on development processes that have a fundamental impact. The once stable economic and technical conditions under which the municipal infrastructure had grown are now largely obsolete, so that the existing regulatory framework in these sectors has to be reconsidered.

3.4 Changes in the Demand for Infrastructure

Until very recently, at least, the demand for infrastructure was considered a relatively stable factor for enterprises, the only notable changes being in growth rates. Consumers were regarded as “public charges,” or as “purchasers” of standardised services for which no alternatives were available, at least in water and energy supply and some telecoms services. The price elasticity of demand was accordingly low.

⇨ WATER

The picture has changed markedly, although very differently from sector to sector. Whereas the telecoms sector is still the most important growth market and the engine of growth for the national economy (“the sky’s the limit”), the demand for energy and water has been stagnating for years. The transition from an industrial society to a service and information society has contributed just as fundamentally to the decline or stagnation of

5 The federal government put capital investment requirements in the distribution network infrastructure over the coming 10 to 15 years at around € 250 billion; see Frank 2000, 12.

6 So-called cross-border leasing models are a case in point. See (with detailed information) Kuchler (2003).

sales as the utilisation of low-consumption appliances and technologies supported by government on grounds of environmental and resource conservation policy. Although there is believed to be room for growth in local transport, little success has been achieved in tipping the modal split in favour of public passenger transport. Sectoral potential for growth has a decisive influence on entrepreneurial strategy, as well as determining the interest private companies take in these markets.

⇨ PUBLIC TRANSPORT

In all sectors, however, consumers have not only become more critical ("more value for money") but increasingly are voicing new demands. They are no longer satisfied with the traditional standard services offered. The shift from "captive purchasers" to "responsible customers" makes new demands on product and price strategy, and especially on corporate information policy. In recent years, modern customer marketing procedures have found their way into corporate planning. For the first time, demand-side developments have become important factors driving infrastructure policy.

3.5 Technical Developments

Changes in the level and structure of demand for infrastructure services are to be seen in the light of technological developments in these areas. For instance, it was the deployment of modern information and communication technology that made services adapted to specific customer needs possible in the first place. Examples are special rate models requiring continuous consumption measurement and the remote monitoring and control of distributed production units. There is still scope for cutting costs in these areas. Greater knowledge about customers' consumption habits can, for example, permit minimisation of peak-load reserves in power and water supply.

At the same time, progress in information processing has made certain organisational models possible which depend on the continuous transfer of real-time information. Examples are the development of electricity exchanges and spot markets and use of electronic market places (B2B, B2C, etc.).

⇨ TELECOMS

Technical progress differs widely from sector to sector. Whereas development in telecommunications is largely technology-driven and manifests itself not only in new transmission technologies with greater power density but, above all, in new products and services, technical progress in the other sectors is largely limited to transport and delivery and direct production (water treatment, power generation, etc.). But these developments, too, can affect market structures in the longer term, because, at least theoretically, they offer unprecedented potential for decentralization[7] and change cost structures in such a way that new economies of scale result.

7 These questions are the focus of the BMBF research association "Integrated Microsystems of Supply".

4. A New Regulatory Framework for Network Industries: Privatisation and Liberalisation

The challenges to the traditional infrastructure model posed by the lack of financial resources, new technical conditions, and different demand patterns has led to a dramatic change in the organisational structures of infrastructure industries within relatively few years. Common to these processes is a new role for government in service delivery.

The privatisation of public utilities is a worldwide phenomenon in the infrastructure field. Privatisation has been pursued for a wide variety of reasons. Efficiency enhancement, financial motives, know-how transfer, and general regulatory considerations have all played a role (Megginson/Netter 2001). The privatisation concept is a very broad one in this context, in practice covering a wide span of different and far-reaching types of private engagement in the infrastructure field. This is also the case in the telecoms, water and energy industries, and in public transport.

⇨ WATER

There is a fundamental trend in all sectors towards formal privatisation (organisational privatisation), i.e., the transformation of public enterprises into companies taking a private legal form. Public undertakings can thus gain greater discretionary powers and are no longer directly subject to the narrow restrictions of cameralistic accounting and public service law. Although this organisational structure preserves close links between the municipality and the enterprise, problems in controlling the undertaking can emerge. For example, it has been shown more than once that local authorities make inadequate use of the tools at their disposal, like investment controlling.[8]

In many cases, the transformation of an enterprise into an organisation under private law is the first step towards asset privatisation, under which ownership passes fully or partly to private third parties. Meanwhile, especially at the local level, many hybrid forms have been developed with competencies, responsibilities, and ownership rights being differently distributed between private and public actors (e.g., management and service contracts, operator models, franchising models). In the telecoms sector most companies are private. Government plays less and less of a role as shareholder. In the energy industry there has traditionally been a mixture of public and private companies, and, here, too, private forms are becoming more important, albeit with differences between production phases.[9]
The water and public transport sectors, in contrast, are largely dominated by municipal public enterprises. Private suppliers tend to play a subordinate role.

Even after years of discussion about reform there is still confusion about key concepts. Many debates suffer from a failure to distinguish adequately between privatisation and liberalisation. Whereas privatisation denotes only the transformation of public into private

8 Cf, the workshop report from the German Institute of Urban Affairs 2003.
9 For the sake of order, it should be pointed out that many of the numerous international groups that have bought their way into the German energy sector in recent years are government-dominated enterprises (e.g., EdF; Vattenfell; Essent, etc.), so that the concept of privatisation applies only to a limited extent.

enterprises, liberalisation refers to the process of opening up statutory monopolies by eliminating barriers to market entry and by introducing competition. Many examples show that liberalisation does not necessarily presuppose privatisation, and that privatisation can take place within existing monopolistic structures.

The opening up of markets, first of all in the telecoms sector and subsequently in the energy sector, took place not only on the political initiative of the European Union in the context of the internal market concept: it was also driven by factors within individual sectors.

The industries under study differ as regards privatisation and liberalisation, as well. While the transformation process from monopoly to competition is well advanced in the telecoms and energy industries, the public transport and water sectors are still at the stage of cautious market opening. Competition in sectors that still display elements of natural monopolies can take a wide range of forms. Specific conditions can make certain competitive options more difficult to implement in some sectors than in others.

The following overview shows the most important competitive options currently to be found in the various sectors. Options are listed in order of increasing intensity of competition.

A competitive regulatory framework is basically expected to put enterprises under pressure to increase efficiency, which can then – theoretically – be passed on to consumers in the form of lower prices and better quality products. The controversial debate on liberalisation has, however, been triggered by fears that liberalisation of these key services and the associated reduction of government influence on service delivery would lastingly endanger the quality and standards attained in the past.

Not only are there more players in the market: new corporate structures are increasingly developing. Several parallel developments are apparent, not all of which impact all sectors.[10]

The elimination of barriers to market entry necessarily means that new suppliers can enter the market with sometimes new offers. High initial investment, insufficient knowledge of the market, problems in accessing available resources and the existing infrastructure, as well as strong consumer inertia are only some of the reasons why newcomers to all liberalised sectors have a hard time holding their own against powerful incumbents and gaining a worthwhile share of the market.

10 Some basic corporate strategies in network industries (e.g., product differentiation, lock-in strategies, or the formation of strategic alliances) are implausible owing to the specific nature of water as a product; see Pollitt 2002.

Table 2: Competitive Options in Network Industries

Competitive options	Notes
Substitution competition	Considerable differences between sectors; high substitution potential in the transport sector; less in the energy, water, and sewage sectors
"As-if competition"	Benchmarking as disciplinary tool; basic comparability of a sufficient number of enterprises is prerequisite (water, transport)
Cartel supervision	Control of the market-dominating position through, e.g., price supervision procedures; methodological difficulties in establishing comparability
Outsourcing	Competitive award of certain corporate functions (e.g., accounting, metering, technical services)
Competition for the market	Competitive award of limited-term public utility franchises (public transport, water)
Competition at the wholesale level	Long-distance supply enterprises in the water sector or generating and transmission companies in the energy sector compete to supply redistributors
Competition for participation in companies	Competition on the capital market: competition for participation in municipal public utilities (*Stadtwerke*) or other municipal companies
Competition within the market: third party access	Competition for major accounts or normal rate consumers
Competition within the market: Infrastructure competition	Competition between companies in the market through the development of competing networks (e.g., network competition in the telecoms sector, construction of own power grids)

⇨ TELECOMS AND ENERGY

The possibility of exploiting economies of scale has triggered substantial concentration processes in recent years. In the classical sectors of local public services, this has meant, among other things, that the region has become an increasingly important universe of action as enterprises shake off their traditional local ties. There has also been a trend not only to horizontal concentration but also towards multi-utilities. The organisational grouping of infrastructure services permits economies of scope, but it is also a reaction to changed customer needs (one-stop services) and an attempt by companies to access new groups of customers through engagement in sectors which they had previously not served. Although the "multi-utility" concept has played a role in the organisational debate only since the mid-1990s (Sommer 2001a, Sommer 2001b, Weiner/Nohira 1997), the

phenomenon is not new. Such groupings of infrastructure services are to be found in the classical German *Stadtwerk*.

Nonetheless, this type of enterprise differs in one important aspect from the internationally operating infrastructure groups that are gaining more and more ground in Germany. Whereas private multi-utilities like the French and British groups operate worldwide but seldom offer several services together in one location, municipal enterprises are locally embedded. They provide their customers with all services (energy, water, public transport, telecoms, waste disposal, etc.), exploiting synergy effects in the process (Rothenberger 2002, Pollitt 2002)[11]

While private groups seek to position themselves successfully in infrastructure markets, becoming increasingly international, municipal enterprises have a much harder time. In their attempts to enter other markets and operate outside their original service areas, they come up against barriers erected by municipal economic law.[12] In view of the general increase in the size of service areas, it is doubtful whether the so-called locality principle can be maintained, especially when it is difficult to justify on economic grounds. The future of the principle remains to be seen. With an eye to establishing an even playing field, municipal enterprises and those who represent their interests have, since the onset of liberalisation, been calling for these legal restrictions at least to be relaxed. On the other hand, such relaxation would put the legitimation of enterprises under public law with their special status under increasing pressure.[13]

⇨ TELECOMS & WATER

While different services are tending to combine, decoupling moves are also apparent in all infrastructure sectors, i.e., the traditional, vertical integration of utilities is being dismantled. In order to increase efficiency and flexibility, value chains are being cut and often reconfigured across regional and sectoral boundaries. A classical business management tool is outsourcing, the hiving off of primarily technical and peripheral functions to permit concentration on core activities. The potential for outsourcing increases as concentration increases the size of the service area.

However, it is very important for network and operation to be kept separate – as competition law at the national and European levels requires. Such “unbundling,” from at least a cost-accounting and organisational point of view, is intended to strengthen competition in these sectors and give new players fair and non-discriminatory access to the existing network structure. This statutory variant of vertical separation in the telecoms

11 Rothenberger points to the lack of studies providing a systematic assessment of the dimensions of economies of scope.

12 The recent takeover of Gelsenwasser AG by a consortium of the Dortmund and Bochum *Stadtwerke* was therefore seen very critically, despite approval by the Federal Cartel Office (Wirtschaftswoche, 18 September 2003). In the past, however, the involvement of municipal enterprises in telecommunications was also regarded as particularly problematic.

13 Municipal economic law is also particularly problematic because state local government supervisory authorities apply widely diverging interpretations of the locality principle. The international engagement of municipal enterprises cannot be otherwise explained.

and energy industries is now being introduced in the water sector (outsourcing of water catchment to separate companies) and in public transport with the organisational separation of networks and service delivery (Fischer/Zwetkow 2003, Stelzer 2001; OECD 2001). Whether the economic advantages of vertical separation outweigh the disadvantages of unintegrated subsystems needs to be considered in each particular case.[14]

Experience in the liberalised sectors has not necessarily been negative. Consumers have gained greater choice, both between suppliers and between products and services, although not all the often high-flying hopes have been fulfilled. Consumers in the telecoms and energy sectors, for example, have been less willing to switch providers than was expected when markets were liberalised. Prices fell drastically for the end consumer, but often only for specific demander groups, and a phase of market consolidation has often been followed by price hikes. However, many fears have proved largely unfounded. Negative effects on environmental quality have not occurred, if only because private companies are naturally bound by the same environmental regulations as public enterprises. A negative impact on the labour market has been largely avoided through appropriate collective agreement arrangements. But, particularly in this connection, the long-term effects of changed corporate strategies are more decisive than short-term consequences. In the water sector, for example, there are justifiable fears with regard to resource regulation that, under competitive conditions, water conservation areas could be discontinued, thus calling in question an important element of preventive groundwater protection.

A particular problem is beginning to emerge in all network industries. There are doubts whether long-term investment to ensure security of supply can be undertaken under the new framework conditions. Blackouts in the North Eastern United States and Britain are partly attributed to deregulation of the energy industry in those countries.[15]

Although even the most vehement advocates of competitive solutions no longer deny the need for economic regulation of at least monopolistic infrastructure segments, international experience has shown that the challenge of regulating these sectors has been greatly underestimated. With the growing number of actors and their complicated interlinkage and contractual arrangements, new market structures have greatly increased control complexity. Only in a few regional telecoms submarkets is there evidence to support the idea that competition can obviate the need for sector-specific regulation (so-called phasing out).

14 These arguments play a particularly important role in discussion on the future structure of German Rail. Whereas the Pällmann Commission recommends largely separating network and operation, transport policy has pronounced against abandoning the vertical structure on the grounds that inadequate coordination of network planning and network operation is likely to cause inefficiency.

15 This analysis is not uncontroversial, but a discussion of the arguments is beyond the scope of this study. Moreover, there is still little or no answer to the not unimportant question of what impact tighter security in reaction to a changed worldwide security situation will have on infrastructure organisation and management. There is discussion on whether an adequate level of security can be achieved under competitive conditions or whether the “market” produces inefficient solutions that necessitate government intervention (MacKerron/Lieb-Doczy 2003, Orszag 2003).

⇨ TELECOMS

It is thus not surprising that the issues dominating the discussion on the future organisation of network industries are not so much privatisation and liberalisation as regulation and reregulation. This is evident from current economic literature and from the innumerable national and international conferences and workshops addressing the subject. As long ago as the mid-1990s, Majone pointed to the "paradoxes of privatization and deregulation" (Majone 1994), referring particularly but not exclusively to British experience with liberalisation. He pointed out that government influence in these key sectors of the national economy had never been so intensively thematized as during privatisation (Hahn 2000; Peltzmann/Winston 2000).

It is therefore particularly interesting to assess the experience gathered in the regulation of sectors that have a considerable period of liberalisation and privatisation to look back on – namely, the telecoms and energy industries – in order to draw conclusions for the water sector.

5. The Future Regulatory Framework of the Water Industry

With a certain time lag the privatisation and liberalisation debate has now apparently reached the last domains of municipal economics, the water and public transport sectors. The debate has flared up with renewed intensity, and many of the questions that had already been raised in the course of liberalisation in the telecom and energy industries are once again the focus of controversy.

The current discussion could be understood as a rearguard action on the part of local authorities, but, particularly as regards our main concern, the water sector, it must be asked whether the experience gained in other sectors and countries and the reform concepts applied there are susceptible to transfer at all. There are various reasons for the widespread scepticism in this regard:

1. the technical and economic conditions for opening the market are unfavourable in the water industry;
2. special public interests are associated with the sector;
3. there is a particular, complex constellation of problems within the sector.

5.1 Technical and Economic Conditions in the Water Industry

Because it is a network industry, water supply shares certain characteristics with other infrastructure sectors, but there are also considerable differences. Water supply is still largely to be classified as a natural monopoly with operational economies of scale,

network and density effects, and high sunk costs.[16] The segment of the value chain that is considered a monopolistic "bottleneck" requiring regulation is very developed (Kessides 2003; WRc & Ecologic 2002; Chavez/Quiroga 2002; Rees 1998). There is accordingly very little economic leeway for introducing competition by establishing new infrastructure.[17] In a comparable situation in the energy industry, recourse is taken to competition for access to the existing network infrastructure. Apart from the fact that there is not yet an interconnected supply network in the water sector, there are also economic limits to common carriage models. The extremely high block of fixed network costs and low variable costs make common carriage, which plays a decisive role in implementing competition in the energy and telecoms sectors, economically viable in only very few, exceptional cases. Moreover, the good transported is a crucial factor. During transport, the quality of the product can change; and qualitative deterioration has direct consequences for the health of consumers. Experience with common carriage models in the privatised British water sector has not been very encouraging. Given the complexity of the area to be regulated, hardly any common carriage arrangements have been realised so far under competitive conditions (DEFRA 2002, Scheele 2001).

However, this experience does not mean "legal unbundling" is not desirable, i.e., the separation, at least in cost accounting terms, of different segments of the value chain in the water industry, with the aim of exploiting the potential for efficiency by dividing off potentially competitive elements. What is being considered in effect is to separate water catchment from the operation of water supply (Fischer/Zwetkow 2003). In each case it must be decided whether the advantages this brings can offset the disadvantages of lost synergy effects. Nevertheless, breaking up vertical structures and highly integrated multi-division enterprises also means disembedding and decontextualising the associated knowledge and human capital. In future, the absence of planning coordination and the interlinkage of now fragmented segments of the aggregation chain will pose a problem requiring regulation by local authorities. Whether the reconfiguration of once vertically linked and now autonomous segments of a value chain will occur more or less automatically in obedience to market forces is at least doubtful.

The most widespread competition models in the water sector throughout the world are franchising models in the broader sense. Competition in the market is replaced by competition for the market. In competitive tendering procedures, competing enterprises are invited to bid for the right to supply a certain area for a certain period. The contract is awarded to the company that can ensure the most favourable rates for the consumer over this period. After expiration of the franchise a new round of tendering takes place. Such

16 Sunk costs are investments needed for a company to become active in a market but which cannot be recovered if the market is abandoned. This means that for the company that serves the market, this investment is no longer a relevant factor in decision-making. At any time it can keep potential competitors out of the market by renouncing coverage of fixed costs in the short term. A classical example of sunk costs are networks. See, for example, Knieps 2001

17 The construction of double service networks offering differential qualities of water has repeatedly been debated, but is viable only in very specific situations.

franchising models can be a relatively simple competition option in cases where other solutions are difficult to implement.[18]

In practice, however, franchising models are far from unproblematic, as experience in France (Elnaboulsi 2001; Roche/Johnnes 2001) and in many developing countries has shown.[19] The problems take many forms:

- restricted competition, because only few companies participate in tendering;
- the danger of collusion between companies;
- often very long franchise terms reduce competitive pressure, while short terms hamper investment amortisation;
- the danger of opportunistic conduct: contractual arrangements are not honoured in the hope of renegotiation;
- companies can have little incentive to comply with conditions towards the end of the franchise term if they see little chance of renewal.

In the case of long-term franchises, not all conditions can be settled in detail at the outset. They are relational contracts permitting flexible adjustment to changing situations while offering a risk of opportunistic conduct by both market parties.

⇨ PUBLIC TRANSPORT

Major problems in tendering out more complex services are how correctly to define the service to be provided, how to capture it in contractual form, and how to monitor adherence. Basically, franchising models have the particular advantage – especially from the point of view of the tendering authority – that they can be combined with every conceivable political objective. It remains to be seen, however, whether it is useful or even practicable to instrumentalize franchising models in this way.

The demands on the regulatory capacity of local authorities have so far been little discussed in the German debate on liberalisation.[20]

5.2 The Water Supply and Public Interests

Prevailing economic theory maintains that market failure legitimates government action; externalities in the production of a good can justify government intervention if market participants do not include them in their calculations. Examples of such external effects are negative ecological consequences of water extraction and the discharge of polluted waste water, as well as the positive effects like high-quality water supply for public health

18 There is meanwhile a comprehensive literature on the various forms of this basic model, so that it is not necessary to treat it in detail at this juncture.

19 See the activities of the World Bank in this field (http://www.worldbank.org/ watsan/) and the critical studies of the Public Services International Research Unit (http://www.psiru.org). But the number of failed projects is relatively low: in most cases in the water sector pricing conflicts have been involved; cf. Harris/Hodges 2003.

20 See the studies by the French organisation Service Public 2000, which seeks to support local authorities in making franchising decisions; cf. Clausen/Scheele 2002.

or improved nature conservation as a by-product of groundwater protection. These had previously been decisive arguments in favour of public water management.

In all countries, access to water resources themselves is subject to special regulation. German legal practice is not untypical in this field. Water is considered a public good subject to governmental rules and conditions of use. In granting rights of use, the public drinking water supply has priority, and competing claims are decided on the “first come first served” principle. Economic considerations have so far played no role. Especially for environmental and resource management reasons, more flexible approaches more attune to the market have long been demanded to provide incentives for the sustainable handling of water. In the political arena, this discussion has made hardly any impression, but the need for regulation has been taken up again in another connection. A primary product market strictly regulated by government confronts a competitively organised supply market, private utilities competing with one another and being allocated the key resources they need for their activities by government in accordance with a procedure whose organisation is not absolutely logical or transparent (Grobosch 2003; Pfister 2002). The prevailing form of governmental resource regulation thus appears to need urgent reform. What self-regulation models are required remains to be seen.

Privatisation of the water industry does not, as is often feared, mean relinquishing control of water resources to private companies. Resources will remain subject to government rules and conditions, but more flexible management methods will prove more apt. Nevertheless, this sector requires greater regulation than others to cope with the many economic, ecological, and social aspects associated with resource use (Brackemann 2000).

At present, water is a focus of international attention because it is considered a key global environmental and sustainability issue. The public water supply is closely associated with a range of societal development objectives and problems (food, health, etc.). Issues of equitable access to water resources (political power issues, conflict potential) play a role, as does safeguarding the quality of potable water (Klaphake 2003, Gleick/Wolff 2002). The water question is clearly a highly sensitive one. More than 1.2 billion people in the world have no access to clean drinking water, and over 2.5 people live without a minimum standard of regular sewage disposal (Enquete Kommission 2002, International Water Association (IWA) & United Nations Environment Programme (UNEP) (2002), Helmig/Kuylenstierna 2001, WBGU 1997). If the ambitious development goals announced at various international conferences are to be attained, enormous investment in infrastructure is needed, which can be financed only with the aid of private capital (World Bank 2003). Given the status quo in this country, many of the problems pending in the international context are, of course, not relevant for the German water sector. Nevertheless, the discussion about a sustainability strategy in water policy that embraces both economic, ecological, and social goals, should be followed with interest in Germany, as well.

5.3 Complex Problem Structures

Owing to the many economic, ecological, and social concomitants of water use and the large number of actors involved, changes in this sector are likely to meet with major opposition. The sectoral analyses have pointed to the problems that have arisen during transformation processes in the telecoms and energy sectors. In these industries, the conditions for liberalisation initially seemed relatively simple. They are particularly dynamic, profitable growth markets with organisational structures that are far less fragmented than in the water sector. The process of transformation from a monopoly to a competitive market seems relatively unproblematic, since it can be assumed that the market-dominating positions of existing suppliers will prove untenable at least in the medium run. Regulatory practice over recent years has shown that this hope has not been met even in these industries.

The telecoms industry has always been nationally oriented. The local level has played no special role either in planning or service delivery. The local authority role in the energy sector was far more developed even before liberalisation, but was much more differentiated. The organisational structure of the German electricity supply industry, with only a few large, supra-regional generating and transmission companies (so-called *Verbundunternehmen*), necessarily meant that local authorities played only a limited role in energy policy. The share of municipal public utilities (*Stadwerke*) in energy production and distribution is not inconsiderable, but most German local authorities have no enterprise of their own. Although local authorities exert direct influence through their right to conclude franchise agreements with power supply companies, they have seldom made targeted use of this tool.

Policy towards the water industry has tended to be confused. Other than in the energy and telecommunications sectors there is, for example, no consistent picture at the European level. EU statements on the subject are inclined to be contradictory. For instance, opinions expressed in the “public services debate” can be interpreted to the effect that water services are outside the remit of European competition law. But in the Internal Market Strategy 2003 - 2006, the Commission has confirmed its intention to open the water sector more strongly to competition (European Commission Community Research 2003; Geiger/Freund 2003; WRc/Ecologic 2002).

At the national level, too, a congruent water policy is lacking. Contrary to frequent public assertions by local representative bodies, there is no common local authority position on current reform. While, for example, municipalities and regions without public transport enterprises of their own are not necessarily against the competitive opening of the market (competitive cost cutting reduces subsidy requirements), local authorities that do have enterprises naturally have to take their ownership interests into account, and necessarily adopt a different position in the policy debate. The situation is even more differentiated in the water sector. The initial idea that competition models tried out in other sectors would be suitable for the water industry has meanwhile been abandoned. But there has been strong opposition even to the basically practicable options in the sector, primarily from local authorities and stakeholders.

Substantiated efficiency and standards of quality are cited in denying the need for structural reform imposed from without.[21] Exponents of this position advance constitutional arguments, and, pointing to the potential for distorting competition, they express serious reservations about mandatory tendering for area franchises. Although they recognise that these proposals are still below the threshold of liberalisation, they claim that "not a stone in the German supply mosaic would remain in place" (Bongert 2003: 7). This seems exaggerated, especially because the tendering procedures demanded in the context of the modernisation debate are not intended to apply for all local authorities but only if authorities wish to transfer functions to third parties. In effect, it is a matter of establishing a statutory regulatory framework for ubiquitous practice in local water management, practice which Salzwedel (2001: 608) describes as a "model of organised irresponsibility." Full or partial privatisation, public-private partnerships, or joint utility solutions are increasingly being used instead of the traditional service delivery by municipal utilities. Not infrequently, the actual responsibilities and distribution of competencies between municipal and private actors are hidden in a thicket of complex company-law interlinkages and franchise agreements and, despite formal municipal responsibility for water supply, actual power structures are not disclosed. Fears about the viability of such private solutions are often the result of this opaque distribution of competencies. Mandatory tendering could make such procedures much more transparent as a whole (Clausen/Scheele 2003). Even benchmarking, which for a long time was favoured as a serious alternative to competition solutions, seems now – to judge by the views expressed by representative bodies – to have been reduced to a somewhat non-committal variant of self-regulation. Rapid agreement on benchmarking did, however, demonstrate that the sector had untapped efficiency potential.

Positions are also no clearer at the federal and state levels. In the federal political arena, the idea of opening the market in the same way as in the energy sector was abandoned, especially in response to the Ewers Report (Ewers et. al. 2001, SRU 2002, Merkel 2002, Michaelis 2001, Laskowski 2003), and a "modernisation strategy" largely within the framework of the old structures was agreed. What reactions the new European initiatives (Internal Market Strategy 2003-2006) and the challenges posed by the GATS negotiations will elicit is still unclear.[22]

Nor is also there any uniform picture at the state level, where economic interests are at loggerheads with environmental and social interests. The conference of state economics ministers took a relatively favourable view of liberalisation (Wirtschaftsministerkonferenz 2002a, b), whereas the ministers of the interior were opposed (Länderinnenminister- und -senatorenkonferenz 2003). And the *Bundesrat*, the federal upper house, has only very recently adopted a position: "Any liberalisation in the sense of market opening that is

21 See, for example, Bongert 2003; also Mensch (2002) with a summary of the current status of the debate.

22 In a strategy paper entitled "EU Internal Market Strategy 2003-2006" the EU Commission (Kommission der Europäischen Gemeinschaften 2003) presents its intentions of strengthening the internal market and announces initiatives for placing the future of the water industry under scrutiny. By the end of 2004 the possibilities for improving competition in the water sector are to have been examined. They do not exclude legislative measures. See also Bundeskartellamt 2003.

imposed on local authorities would be incompatible with the right of local self-government and would threaten the quality of the German water supply." (Bundesrat 2003).

While state governments, largely regardless of their political party complexion, have tended to keep aloof from the water sector, being apt to support present structures, they do, of course, make policy and their decisions consciously or unconsciously influence market structures to an extent that could not be achieved even through liberalisation. This policy tends to be made through informal, internal arrangements and is put into direct effect via the often close links between ministries and big companies.

This juxtaposition of controversial positions, frequently on the same political level, and adopted on the basis of predictable but covert agreements, is due primarily to the lack of attention paid to the goals of sustainable local infrastructure development.

6. A Provisional Conclusion

The analysis of developments in infrastructure sectors has produced a very differentiated picture. The water market, in particular, displays a number of unique features, and the starting position for reform in this sector is especially complex at the present time. This complexity is apparent both at the level of problem analysis (new, parallel, patterns of coupling and decoupling, spatial overlap of functional areas, concentration and internationalisation processes), and at the politico-instrumental level.

Despite justified criticism on the details, developments in the telecoms and energy industries are often considered to be successful and to offer suitable models for the water sector to follow. Within a relatively short space of time, ambitious reforms have been implemented in these industries subject to strict political conditions. In both the telecommunications and energy industries the principal concern was HOW and not WHETHER change was to be brought about. Leaving aside different ideas about institutional arrangements for regulation and for the speed of reform, there have been relatively few political differences between the national and Europeans levels.

⇨ TELECOMS AND ENERGY

The current debate throws light on the specific characteristics of the water industry. The need for reform of the sector is the prime subject of discussion. The tools and institutions required for implementing the reform agenda are discussed only in second place. Nevertheless, it is unlikely that the European Commission will back down in its efforts to implement competitive concepts in this field, too, especially when one considers that discussion at the national level often fails to recognise the substantial moves towards market liberalisation that have already been made. In this context, the special role of the Transparency Directive should be kept in mind.

Controversy in Germany about the a future regulatory framework for the water industry has been dominated primarily by discussion on municipal public services and the required arrangements for local self-government; at the same time, however, regulatory

intervention is consciously being avoided. Nevertheless, policy is being made by omission or at best through a failure to object when large companies more or less take the matter into their own hands, creating structures in this phase of uncertainty and political abstinence that may be reversible only in the long term.

Opening the network market is associated with hopes of deregulation and – in regulative policy terms – of a government rollback. However, experience in the energy and telecoms sectors and in countries with a fully privatised water sector suggest that these expectations cannot be fulfilled, and that, on the contrary, completely new regulatory challenges are to be faced. Reregulation is the dominant issue in the liberalisation debate.[23]

The water sector in Germany is underregulated by comparison. Government control and supervision concentrate on environmental and resource aspects, whereas the regulation of economic aspects is either not on the agenda or is delegated to the local level.

This situation will change markedly in coming years. Traditional regulatory functions – which will also be coming under scrutiny – will be increasingly joined by new regulatory and control functions which, in all probability, will no longer be practicable at the local level. Moreover, the demand on regulatory capacities will increase as more or less uncontrolled structures develop, largely the outcome of corporate strategy decisions.

⇨ TELECOMS

These new regulatory requirements will also determine the direction of "netWORKS" research. With no claim to comprehensiveness, certain aspects of this emerging debate can be noted.

Wide areas of competition law currently do not apply with respect to the water industry, although there is now notable competition at the wholesale level and for major accounts, and, especially, competition for participation in utility companies. It is the lack of transparency in these processes and in the emerging market structures that rightly provokes criticism. More and more frequently, municipal water utilities are becoming the focus of internationally operating groups of companies, for whom they are objects of strategic capital investment, without clarity being established about local authority responsibilities and control mechanisms. Not infrequently, it is also larger municipal enterprises that engage in more or less unregulated activities beyond their original ambit. For instance, in the battle for Gelsenwasser, the largest private water utility company, two *Stadtwerke* (municipality-owned groups of utilities) won the day over allegedly bigger private competitors, setting their hopes in, among other things, pension funds and thus in high returns in a overall low-risk line of business. All these developments are occurring simultaneously, while municipal stakeholders evoke solely the preservation of municipal public services and the role of municipal enterprises in safeguarding ecological and social

23 Particularly interesting are, however, new developments in Britain, where, in view of stricter regulations, private firms are increasingly seeking to rid themselves of costly infrastructures, transferring them to loan-financed cooperative models; cf. Bakker 2003; Birchall 2002.)

standards. When local authorities no longer wish to delivery services themselves, is talk of a “sell-out” of legitimate municipal interests or even of “forced tendering” justified when an even playing field and transparent procedures are called for in awarding contracts? This naturally raises certain as yet unsettled issues in the water sector. How are such tendering procedures to be carried out and how are they to be dealt with organisationally? Can the services to be tendered out be comprehensively and precisely enough defined without diminishing incentive effects? What chance is there for more far-reaching local authority objectives in the labour market, ecology, gender equity, social security, and the like? Certain rulings of the European Court of Justice have not always elucidated the specific provisions of EU law. However, over and beyond the legal reliability of such criteria extraneous to contracting procedure, the question remains whether, from an economic point of view, it is wise in the long term to have important local authority services purveyed by utility companies.

Development processes also require reinterpretation of municipal economic law, which, at least formally, has so far restricted corporate activities (Püttner 2002, Nagel 2000, Held 2002). In their endeavours to remain competitive, how far may and can municipal enterprises take their engagement? The more their internal structures and conduct approximate to those of private companies, the more difficult it becomes to define what is specifically municipal about a municipal enterprise. In their efforts to justify their existence they undermine their own foundations.

What is crucial at present, however, is to reinterpret the locality principle. Although municipal enterprises have to accept certain limitations to their sphere of influence, slavish insistence on municipal boundaries is unreasonable and, in view of the developments described, will in the long run be an untenable policy. It is still unclear what could supersede the traditional locality principle. It could, for example, be extended to larger territorial units, such as spatially interlinked city networks/city alliances, or to territorial units similar to those under the Water Framework Directive, which cover entire river basins.

Growing urbanisation and metropolisation makes reinterpretation of the locality principle particularly urgent. Economic agglomerations like Greater Hamburg, Munich, Rhine-Main, Cologne-Düsseldorf, or Dresden-Halle-Leipzig no longer coincide with existing local territorial administrative units.

Developments in network-related infrastructure sectors and the changes described also differ from a spatial point of view. Particularly in metropolitan regions, infrastructure industries are undergoing substantial concentration and multi-utilities are being formed. International groups are especially interested in enterprises in such regions because of their growth potential and the customer access that infrastructures offer. The question arises whether additional regulation is needed as market power increases and lasting influence on relations between the city and surrounding areas accrues. From a spatial economics standpoint, greater attention needs to be given to whether changes in sectoral structures and the resulting changes in corporate strategies trigger processes that intensify disparities, and whether different types of area have different regulatory needs and capacities.

In spite of all the changes taking place in the water industry, competition models familiar from other infrastructure sectors cannot be transferred. This makes the regulation of enterprises that still have a regional or local monopoly an all the more urgent issue. A closer look needs to be taken at benchmarking models. The focus should be on how such models, which in the past have mainly been applied in business administration, can be instrumentalized in the interest of a sustainability strategy embracing ecological and social aspects.

And, finally, the question of resource regulation under the new, competitive conditions needs to be addressed. Not only resource regulation in the narrower sense must be considered but also more fundamental forms of long-term resource conservation. New regulatory models are surely needed if entire groundwater protection areas and the associated water supply facilities come under pressure for reasons of cost and efficiency.

Although the water industry is indeed a sector like no other, this is no reason to assume that reform is unnecessary. This would be fatal for the long-term development of what remains a key sector of municipal development.

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Appendix 1

Overview 1: Regulatory Requirements in the Water Sector

Overview 2: Segments of the Value Chain by Degree of Competitive Orientation

Overview 3: Selected Characteristics of Network Industries

Overview 1: Regulatory Requirements in the Water Sector

Function	Regulatory requirements	
Water resources	▪ Water Framework Directive implementation ▪ Enforcement of ecologically adapted land use	▪ **Tendering for area franchises** ▪ **Price control** ▪ **Competition law** ▪ **Public participation**
Water catchment	▪ Regulation of water catchment rights ▪ Designating and safeguarding water conservation areas ▪ Safeguarding potable water quality standards	
Water transport	▪ Development and maintenance of distribution networks ▪ Interconnection of networks ▪ Competition law arrangements: access to networks	
Water distribution	▪ Safeguarding quality standards ▪ Safeguarding replacement investment	
Sales	▪ Regulation of access to water ▪ Price policy: rate structure ▪ Supply conditions ▪ Information obligations	
Water use	▪ Quality and supply standards ▪ Regulation of private supply	
Sewage treatment	▪ Water Framework Directive implementation ▪ Wastewater Charges Act	
Wastewater discharge	▪ Supervision of pollutant disposal	

Overview 2: Segments of the Value Chain by Degree of Competitive Orientation

Sector	Segments that are not usually competitively organisable	Segments that are usually competitively organisable
Public transport	Rail network, signal infrastructure	Operation of facilities, supportive facilities and installations
Electricity	High voltage transmission networks; local distribution networks	Electricity generation, electricity trade, marketing; account management, etc.
Gas industry	Long-distance networks, local distribution networks	Gas production, gas storage, trading and marketing activities
Water supply	Long-distance networks, local distribution networks, water catchment	Operation of water catchment facilities, value-added services, customer services
Sewage disposal	Sewerage systems	Operation of sewage treatment plants, accounts, sewage sludge treatment
Telecoms	Local networks	Long-distance; mobile services, value-added services, local services, especially in heavily built up areas

Overview 3: Selected Characteristics of Network Industries

	Public Transport	Water	Energy	Telecoms
Technical progress	Low: developments in vehicles; customer service, accounting	Low: further development of existing technologies, e.g., in water treatment	High: efficiency enhancement in energy production, new customer services, sustainable power	Very high: new transmission technologies, new products, cross-sectional technology
Role of local authorities	Strong municipal role: ultimate unit of responsibility, operation	Municipal role still important, but trend towards regionalisation	Very differentiated picture; municipalities with own public utilities, regional suppliers, generating and grid companies (*Verbundunter-nehmen)*	Only small role; engagement of municipal enterprises in telecoms controversial; hardly any legal influence of local authorities
Demand develop-ment	Stagnation or only slight rise in demand; future development depends strongly on political conditions	Stagnation of demand, further decline of consumption in some regions	Stagnation of consumption, promotion of savings for reasons of energy and environmental policy	Consistently high growth rates
Internation-alisation	No cross-border activities, participation by foreign companies in some municipal enterprises	Limited foreign involvement in the German water sector; some holdings by German companies abroad	Cross-border activities, relatively strong international links	Cross-border activities, relatively strong international links

Sector	Form of ownership	Liberalisation	Regulation	Regulatory problems
Electricity industry	Quasi-public, on-going privatisation trend	Complete market opening: competition in and for the market	Cartel authorities, government price controls, voluntary agreement on network access; continuing discussion on sector-specific regulators	Conditions and prices for network access; big price differences; self-regulation controversial; concentration processes
Water supply	Largely municipal; no major role for private enterprise to date	So far competition the exception; forms of competition for markets; weak substitution competition with private supply	Municipal influence, municipal supervision, environmental authorities, to a limited extent cartel authorities	Safeguarding environmental quality standards; unsettled technico-organisational common carriage issues; evidence of price abuses
Telecoms	Largely private; municipal enterprises among city carriers	Complete market opening	Regulatory Authority for Telecommunications and Posts	“Last mile” problem, continued dominance of Deutsche Telekom in local exchange business; setting of access charges still controversial
Cable networks	To date dominance of Deutsche Telekom at network level; privatisation trend; purchase of regional networks by US/British groups	Replacement of public by private monopoly; competitive tendering; intensive substitution competition with telecoms industry	Regulatory Authority for Telecommunications and Posts, state media authorities	Allocation of frequencies; influence of minority shareholder Deutsche Telekom on decisions of private cable network operators
Public Transport	So far largely municipal and regional companies; privatisation tendencies	Competition for the markets in suburban rail transport; hardly any competition so far in road-bound public transport	Cartel authorities, municipal supervision, state public transport companies	Content and mechanisms of tendering; quality assurance; non-discriminatory network access for rail-bound public transport

Sector	Results of liberalisation	Market structure	Unbundling	Market entry	Investment requirements
Electricity industry	Price cuts mainly for major accounts; new products, security of supply so far not threatened;	Persistently strong concentration processes; oligopolistic structures at the generation level	Legally prescribed; separation between different network areas and operation	Open, no legal restrictions	Increasing in future; replacement requirements in generation and network areas
Water supply	So far no market opening, modernisation strategy leading to increased efficiency	Small-scale structures; growing concentration processes; but degree of concentration so far relatively low	Separation of water catchment and water treatment/distribution: first approaches	Limited; Para. 103 Restraints on Competition Act; access to water resources limited	Stable, replacement needs in networks; implementation of Drinking Water Ordinance
Telecoms	Often drastic price cuts for all demander groups; new products and services;	Market-dominating position of Deutsche Telekom; competitors with larger market shares in submarkets	Separation of segments prescribed; technically no problem	Open, no legal restrictions	High; new network infrastructure; cable networks; introduction of new products
Public Transport	Overall improvement in quality and services since beginning of discussion; reduction in public subsidy requirements in cases of competitive tendering	Predominantly small-scale structures, slight increase in degree of concentration	First moves towards separating network infrastructure and operation	Legal barriers, franchising law	High: network infrastructure, vehicles, new information systems

Appendix 2

netWORKS Papers

The findings of the netWORKS Research Association are published in the series netWORKS Papers, the full text of which is published in the Internet and in printed form in a small edition. Local authorities may order these publications free of charge – as long as stocks are available – from the German Institute of Urban Affairs. Academic customers and the specialist community can download the texts free of charge from the project platform www.networks-group.de. The following Papers have appeared to date:

- Kluge, Thomas/Scheele, Ulrich
  Transformationsprozesse in netzgebundenen Infrastruktursektoren. Neue Problemlagen und Regulationserfordernisse
  Berlin 2003 (netWORKS Papers, No. 1)
- Kluge, Thomas/Scheele, Ulrich
  Transformation Processes in Network Industries. Regulatory Requirements
  Berlin 2003 (netWORKS Papers, No. 1)
- Kluge, Thomas/Koziol, Matthias/Lux, Alexandra/Schramm, Engelbert/Veit, Antje
  Netzgebundene Infrastrukturen unter Veränderungsdruck – Sektoranalyse Wasser
  Berlin 2003 (netWORKS Papers, No. 2)
- Bracher, Tilman/Trapp, Jan Hendrik
  Netzgebundene Infrastrukturen unter Veränderungsdruck – Sektoranalyse ÖPNV
  Berlin 2003 (netWORKS Papers, No. 3)
- Scheele, Ulrich/Kühl, Timo
  Netzgebundene Infrastrukturen unter Veränderungsdruck – Sektoranalyse Telekommunikation
  Berlin 2003 (netWORKS Papers, No. 4)
- Monstadt, Jochen/Naumann, Matthias
  Netzgebundene Infrastrukturen unter Veränderungsdruck – Sektoranalyse Stromversorgung
  Berlin 2003 (netWORKS Papers, No. 5)