



A research project supported by the European Commission

FP5: Energy, Environment and Sustainable Development
Key Action 4: City of Tomorrow and Cultural Heritage
Thematic Priority 4.1.2: Improving the quality of urban life
Contract No: EVK4-2002-0095

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D34: WaterTime case study – Munich, Germany

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31st January 2005

One of 29 WaterTime case studies on decision-making on water systems

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1 Introduction

1.1 General considerations

The Watertime project is based on the exploration of 29 case studies. These case studies are expected to provide information on the interaction between a range of political, economic, social, technological and environmental factors, at various levels, on the parties and processes involved in decision-making, including the constraints on decisions and objectives of decision-makers, so that models can be developed of these interactions to guide future decision-makers.

The selection of the case studies was made not by sampling on the basis of indicators at a given point in time, but rather on the basis of known examples of decision-making processes where a variety of factors, constraints and objectives could be observed. The analytical narrative approach goes beyond detailing the case to elaborate more general conditions for decision-making processes. This means there must be criteria for selection of cases other than their intellectual appeal.

The cities are thus not selected as a representative sample from which statistically significant generalizations and predictions can be made – most cities in Europe have probably undergone relatively few system changes and have continued in a ‘steady state’, which may be the prevailing condition– although the criteria for analytical narratives also include features that make the cases amenable to modelling, providing an opportunity to get at an important process or mechanism not easily accessible through other means.

Most of the case studies, however, are cities where the steady state has been affected by some initiative or contingency – e.g. a proposal for new sewage treatment plants, or for a form of private sector operation, the switch to a different water resource – which has generated some decision-making process involving a range of factors, actors and processes.

The case studies provide an opportunity to study the elements of the decision-making process in each city. These elements are not pre-determined and not restricted to local levels. They may include local consumer group activities, policies of development banks, regulatory decisions, municipal votes, multinational business strategies, ministerial rulings, supra-national environmental decisions, or many others. The transparency involved and the scope for participation also vary.

The German case studies are on Berlin and Munich, the No.1 and No.3 cities in size in Germany, both developing and changing rapidly. At the level of water supply and sanitation, the effects of the development are felt very differently. A comparison of the two cities should reveal which of the factors observed to be ruling decision-making in the water sector are typical for large German municipalities, and which are a result of political instability, excessive financial constraints, and limitations of the resource base.

1.2 The Munich case

Munich can be regarded as a city with a water sector in steady state, politically and technically. The resource situation is comfortable, with large underground reservoirs and high quality water imports from nearby mountain areas. The city is stable in size, water demand slowly sinking. The only major effort necessary to safeguard future supplies are precautionary measures to protect the underground resource from agricultural pollution. The Munich water company has recently invested in supporting farmers to switch to organic farming methods, a route regarded as less expensive than treating polluted raw water.

With a very stable political situation – no change of government at either local or regional level in the past twenty years – the main factor of potential instability is finances. While water and wastewater units are financially solid and even generate a surplus, the city’s budget is a cause of continuous concern. However, the social-democratic mayor has recently opted against a partial sale of the water company, a decision generally endorsed by the conservative Bavarian regional government. There is also a rather strong public sentiment against private involvement in the water sector in Munich.



2 City background

Munich is Germany's third city in size after Berlin and Hamburg. It is located in the South of Germany in the federal Land of Bavaria that is special in many respects. Bavaria is without doubt the most independent and autonomous Land in the federal system of Germany, and has been ruled with comfortable majorities by the conservative Social Christian Democrats CSU (the Bavarian sister-party of the Christian Democrats CDU) since 1949. In contrast, Munich itself has traditionally been under social democratic rule (SPD).

Water consumption in Munich was about 207 litres per day and capita in 2001 (including industrial and public uses). 1.4 million people are being supplied with drinking water within the city and in its immediate outskirts. The total quantity of water delivered is 116 million cubic metres (mcm) per year. Munich draws its drinking water from exceptionally good groundwater resources in the Alps about 40 kilometres south of the city. Supply is exclusively from these alpine groundwater sources, local groundwater can be used to supplement the supply when very high short-term demand occurs, or in emergencies.

Wastewater is collected from virtually all households in Munich, treated to a very high standard (including disinfection) and discharged to the medium sized, yet quickly flowing river Isar (a tributary to the Danube). All along the river, disinfection technology is applied in the wastewater treatment plants, also upstream of Munich. Thus the Isar's water quality has improved to allow swimming in the river, which is a main pastime of Munich in summertime. The city regards upgrading the river as a useful investment in the future by raising the city's attractiveness to both investors and tourists.

3 The Munich water and wastewater undertakings

Water supply and sanitation services are organized in entirely separate units in Munich, with the water supply company being part of SWM Stadtwerke München (a 100 per cent municipal company responsible for water, gas, energy and public transport). Wastewater as well as urban storm water is collected and treated by 'Münchner Stadtentwässerung' (MSE, Munich drainage works), a 100 per cent municipal utility, yet entirely separate from SWM.

3.1 Water undertaking profile

3.1.1 Overview

The undertaking responsible for drinking water supply in Munich is Stadtwerke München GmbH (plc), an independent company owned 100 per cent by the city of Munich. Stadtwerke München GmbH is running electricity, gas and water supply of the city as well as public transport and public swimming pools. It is Germany's largest municipal company, and is made up of three subunits: SWM Versorgungs-GmbH covering electricity, gas and water, Münchner Verkehrsgesellschaft mbH for the entire public transport and M'net, a company offering telecommunications services. Turnover in 2003 was Euro 2.0 billion, and with a profit of Euro 67.2 million, SWM have been the most important taxpayer in Munich (despite BMW and Siemens being located there). Its investments of Euro 389.4 million have also made it the largest investor of the city.

Drinking water supply was until 2004 a separate unit within the larger SWM Versorgungs-GmbH responsible for supplying electricity, gas and water. Then, by 1st January 2004, an important change of legal organization took effect: water production (abstraction and source protection) was retained as a separate unit, while water distribution (i.e. water infrastructure) was merged with gas and electricity distribution and networks. Likewise, water, gas and electricity sales operations are combined in a further unit. These three vertically unbundled units still operate under the private law Stadtwerke München GmbH (SWM) and are hence one hundred per cent owned by the city of Munich. In effect, three legally and organisationally independent companies are now responsible for delivering water to consumers in Munich. Munich's water supply system was one of the first drinking water suppliers in Germany to undergo unbundling, yet not the

only one. It should be noted that this process was motivated and driven by EU electricity market unbundling legislation taking effect. However, there is no legal requirement to extend unbundling to the water sector.

Although little information on the effect of water sector unbundling is available so far, a pronounced tendency to increased cost cutting and commercialisation has been reported. Employees feel that due to the split of water operations into three separate companies, responsibility for total water cycle management has been compromised, and that the traditional work ethic and pride to be employed by “the water works” are disappearing.

Although the city of Munich is the exclusive owner of Stadtwerke München, its influence on strategic decisions is rather limited. The SWM supervisory board in which municipal representatives have the majority (with the mayor as president) and to which the management is responsible, appoints the management, but otherwise has limited powers. It is up to the city parliament however to change these rules: For instance, it voted in 2003 to make cross-border leasing contracts subject to parliamentary approval. This step was taken in the face of continued rumours about intended cross-border leasing contracts (involving partial transfer of SWM asset ownership away from the city), which until then had been under the exclusive discretion of the SWM management.

Table 3.1: SWM Company Overview

DATA	CONCEPT
Stadtwerke München GmbH	Name
Geographical scope <ul style="list-style-type: none"> • Nation • State • Region • Local 	Scope of activity of the organisation as a whole. One single choice can be replied as “yes”
Type of activity Water supply and <ul style="list-style-type: none"> <input type="checkbox"/> No other activity <input type="checkbox"/> Wastewater <input type="checkbox"/> Storm water and drainage <input type="checkbox"/> Electricity <input type="checkbox"/> Gas <input type="checkbox"/> District heating <input type="checkbox"/> Other (specify)Public transport..... 	Scope of activity of the organisation as a whole, beyond the water supply (multiple choices are valid)
Type of assets ownership <ul style="list-style-type: none"> ▪ Public ▪ Private ▪ Mixed 	Ownership of the undertaking infrastructure. One single choice can be replied as “yes”
Type of operations <ul style="list-style-type: none"> ▪ Public ▪ Private ▪ Mixed 	Type of operational management of the undertaking. One single choice can be replied as “yes”.
Total personnel (no) SWM total 7317 (2002), 7191 (2003) (cp. 7661 in 2000) (Source: SWM annual reports 2003, 2001) Water only: circa 2600 (Source: public services union ver.di 08.12.2003)	Total number of undertaking employees dealing with services production
Outsourcing (per cent) n.a.	Estimated cost percentage of all the functions that are outsourced
Annual costs (EUR/a) SWM total: 1.793 billion (2002), 1.724 billion (2003) n.a. for water alone	Annual costs including capital, operations, maintenance (including external manpower costs) and internal manpower costs
Annual sales revenue (EUR/a)	Operating revenues + interest income



<p>SWM total: 1.908 billion (2002), 1.961 billion (2003)</p> <p>Water only: 111.6 million (2002), 109.8 million (2003)</p> <p>(Source: SWM 2003 annual report)</p>	
<p>Average annual investment (EUR/a)</p> <p>SWM total: 242.1 million (2002), 389.4 million (2003)</p> <p>n.a. for water alone</p> <p>(Source: SWM annual report 2003)</p>	<p>Cost of the investments over the last three years /</p>
<p>Tariffs (EUR/m) Fixed household tariff:</p> <p>Euro 1.15 per cubic meter (2002), 1.22 (2005)</p>	<p>Average water charge</p>

3.1.2 Detailed data on Stadtwerke München (water undertaking)

Please refer to Annex A.

3.2 Wastewater undertaking profile

3.2.1 Overview

Wastewater collection and treatment as well as storm water collection and treatment in Munich are run by ‘Münchner Stadtentwässerung’ (MSE, Munich drainage works), a municipal utility, yet entirely separate from SWM. Münchner Stadtentwässerung (MSE) is 100 per cent owned and controlled by the city of Munich, with separate staff and accounting (Eigenbetrieb, municipal utility). The management, consisting of a technical and a financial manager, is directly responsible to a city employee, the Works ‘Stadtrat’. Management and the Works Stadtrat usually take strategic decisions jointly. In Munich, the post of Stadtrat is not a political, but a permanent professional one. Each Stadtrat is responsible for one of eleven different policy fields (e.g. economics, finances, education, health). These persons take their orders directly from the mayor who presides a directorate and has two assistant mayors.

Three leading staff members and seven team leaders assist the two MSE managers:

Technical manager

Financial manager

- MSE WL B Management office
- MSE WL C Controlling
- MSE WL IR Interior revision
 - MSE P Staff and information technology
 - MSE B Accounting
 - MSE Z Central tasks
 - MSE 1 Sewer construction
 - MSE 2 wastewater treatment plant construction
 - MSE 3 Operations
 - MSE 4 Household drainage



Table 3.2: MSE Company Overview

DATA	CONCEPT
Münchner Stadtentwässerung MSE	Name
Geographical scope <ul style="list-style-type: none"> • Nation • State • Region • Local 	Scope of activity of the organisation as a whole. One single choice can be replied as “yes”
Type of activity Water supply and <ul style="list-style-type: none"> <input type="checkbox"/> No other activity <input type="checkbox"/> Wastewater <input type="checkbox"/> Storm water and drainage <input type="checkbox"/> Electricity <input type="checkbox"/> Gas <input type="checkbox"/> District heating <input type="checkbox"/> Other (specify). 	Scope of activity of the organisation as a whole, beyond the water supply (multiple choices are valid)
Type of assets ownership <ul style="list-style-type: none"> ▪ Public ▪ Private ▪ Mixed 	Ownership of the undertaking infrastructure. One single choice can be replied as “yes”
Type of operations <ul style="list-style-type: none"> ▪ Public ▪ Private ▪ Mixed 	Type of operational management of the undertaking. One single choice can be replied as “yes”.
Total personnel (no) 815.57 (source: MSE 2004)	Total number of undertaking employees dealing with services production
Outsourcing (per cent) 17 per cent (18.979.453 € of 110.806.002 €) (Source: MSE 2004)	Estimated cost percentage of all the functions that are outsourced
Annual costs (EUR/a) 110.806.002 € (source: MSE 2004)	Annual costs including capital, operations, maintenance (including external manpower costs) and internal manpower costs
Annual revenue (EUR/a) 268.611.702, --€/a (source: MSE 2004)	Operating revenues + interest income
Average annual investment (EUR/a) 40.491.000 € (source: MSE 2004)	Cost of the investments over the last three years /
Tariffs (EUR/m) 1,56 €/m³ (wastewater), additionally if relevant 1.30 €/m² (rainwater). Only about 50.000 citizens of Munich have to pay for the treatment of storm water (e.g. 29.000.000 € of the sales revenues result from rainwater treatment).	Average wastewater and storm water charge

3.2.2 Detailed data on Münchner Stadtentwässerung MSE (wastewater undertaking)

Please refer to Annex B.

4 Actors in water and wastewater services provision

4.1 Overview

The actors in all episodes – no matter if they concern water supply or wastewater operations – are in principle the same (for an overview, please refer to Table 4.1):

1. Mayor (SPD) and his executives (Stadträte, permanent professional posts)
2. Municipal parliament, both majority (SPD) and opposition (CSU, Greens, FDP)
3. Employees of the public enterprises and their legal representation (Betriebsrat)
4. Public services union (local, regional and national units)
5. Management of Stadtwerke München (100 per cent municipal company SWM)
6. Directors of Münchner Stadtentwässerung (Eigenbetrieb, municipal utility)
7. NGOs and citizens' organisations
8. Local press

The influence of private utility companies, which has been identified in other case studies, has not played a decisive role in Munich in the past. While commercial and industrial interests are normally strong players in Bavaria and Munich, all parties regard drinking water supply and wastewater management as a central obligation of the state and the municipalities.

There has been quite strong an impact of consultancies, mainly in the internal restructuring processes following the various changes in organisation or legal status in the 1990s. This impact was however limited to structural issues, with only minor influence on strategic decisions.

4.2 The mayor and the city executives

Munich has been ruled by SPD mayors for decades. The current mayor, Christian Ude, has many times publicly proclaimed to be opposed to water privatisation, not only in Munich. He has been in power for over ten years, and no important changes are possible without his consent.

4.3 The city parliament

On the subject of drinking water and wastewater, the parliament, both ruling party and most of the opposition, fully supports Ude's policies (apart from the liberals, FDP, a negligible force in the municipal parliament with well under 10 per cent of the delegates). The situation is further stabilised by the fact that the regional majority party in Bavaria (CSU) also strongly favours public management of the water and wastewater sector.

4.4 Employees of public enterprises

The importance of the legal representation of public service employees is fully supported by the various episodes in Munich. They did not only defend employees' rights within the public undertakings, they also took the leading role in getting civil society involved in some strategically important decisions on water and wastewater operations in Munich. Without their vigilance and activity, there clearly wouldn't have been any public attention or discussion of the contentious proposals for an SWM/MSE merger (see Episode 1) and a cross-border leasing contract of wastewater treatment plants (see Episode 2). Without this legal representation and its legally required involvement, both proposals would have passed almost unnoticed by



the wider public. In this regard, it is alarming that currently some regional governments in Germany (e. g. Hamburg) are intending to weaken or even abolish employees' representation in public service undertakings.

4.5 Public services union (ver.di, formerly ÖTV)

The public services union ÖTV and its successor ver.di have always strongly argued against any kind of privatisation. In fact, the local and regional ÖTV units strongly supported MSE employees in their opposition to the proposed merger in 1999 of water and wastewater units under SWM roof (see Episode 1). However, unions and employees' representatives obviously had little influence on the decision to legally unbundle and restructure SWM-Versorgungs-GmbH in 2004 (either because of a lack of prior knowledge, or because of tacit approval). ver.di representatives within the wastewater company are leading figures in coordinating local and regional anti-privatisation activities with Attac and other external NGOs (Wasser Allianz München, WAM).

4.6 Management of Stadtwerke München (SWM)

The managing director of SWM, Kurt Mühlhäuser, has been holding that position for over ten years, and enjoys full support (and friendship) of the mayor of Munich, Christian Ude. He must be regarded as the most powerful actor concerning privatisation issues in Munich. Officially, he supports the Wasser Allianz München (WAM), a network of NGOs, unions and civil society against privatisation (see below). On the other hand, his moves are often difficult to predict, and once he has made up his mind, he seems difficult to convince otherwise. He is a strong supporter of market values, but doesn't want them applied to the water sector. On the other hand, he decided to involve the water supply unit in the unbundling exercise in 2004, arguably exposing it to strong commercial and market forces.

4.7 The directors of Münchner Stadtentwässerung (MSE)

The technical director of the wastewater unit, Joachim Eichinger, likewise has been holding that post for more than ten years, and is a civil servant with no inclination to enter into private adventures. He has opposed both cross-border leasing arrangements for Munich's wastewater treatment plants (Episode 2) and the merger with the drinking water company in 1999 (Episode 1). He is currently considering changing the legal form of wastewater operations from municipal utility to a public law company (Anstalt des öffentlichen Rechts, AdöR), which would give the management more freedom and flexibility. He is however aware of the vagaries of such a move, in that a public law company is much more vulnerable to privatisation attempts from outside. The technical director has a financial director, likewise a civil servant, by his side. The former person on this post was a major driving force behind the CBL proposal, but has since retired.

4.8 NGOs and citizens' organisations

Lately, public awareness in Munich on privatisation particularly in the water sector has increased markedly. An umbrella organisation dealing exclusively with local water issues (Wasser Allianz München, WAM) has been established comprising environmental, development, and other organisations as well as public services union ver.di. Public attention now seems to have reached the critical level to efficiently influence decisions in the city. It seems however that the latest decision in 2003/04 to unbundle SWM's utilities branch including the water supply system was hardly affected by public opinion at all.

4.9 Local press

Compared to the situation in Berlin, press coverage of water issues, particularly organisational changes, has been relatively patchy in Munich. For instance, the important unbundling step within Stadtwerke Munich produced one single article at a time when the decision had already been taken. No other mention was made of this important step. The press coverage of the two detailed episodes in this case study was better, although it must be said that independent journalistic investigations were only initiated following press releases by the public services union. The public attention (and opposition) created by the various articles on SWM/MSE merger (Episode 1) and cross-border leasing (Episode 2) increased visibility and pressure on the involved politicians and executives. Without this pressure, both proposals are likely to have gone through. In this sense, the local press have played a pivotal role in these episodes.

Table 4.1: Key actors in Munich case study episodes

Actor	Name	Description	Role in Water cycle	Power and influences	Goals
PE1	Baureferent	Municipal public servant responsible for sewage works and Stadtwerke. The Baureferent is one of eleven permanent (instead of elected) professionals responsible for different policy fields in Munich	Immediately responsible supervisor of MSE and Stadtwerke within city government	In close daily contact with MSE management (public co-manage). Supervisory role in Stadtwerke München much less influential due to independent legal status of SWM	Securing present and future water supply and wastewater operations
PE2	Munich mayor	Elected mayor of the city, long-time and currently social democrat (SPD)	Finally responsible for water, wastewater and urban drainage as well as for public enterprises (SWM)	Ultimate power without whose consent strategic changes are not possible	Functioning water supply and wastewater management, outspoken supporter of public ownership and control of utilities
PE3	Stadt-kämmerer	Municipal administrator responsible for city finances	None.	One of eleven colleagues as 'referent' to the mayor, responsible for city finances	Higher emphasis on efficiency gains than on long-term stability of services
PE4	Stadtrat	Municipal parliament.	Close supervision of wastewater activities by Stadtrat's works committee.	Important decisions such as sale of public undertakings need formal Stadtrat approval. In addition, Stadtrat in 2004 voted for all cross-border leasing contracts of municipally owned companies to be subject to its approval.	Generally critical to water sector privatisation and liberalisation (depending on party line)
PO1	CSU in Munich parliament	Second largest party fraction in Munich parliament, main opposition party	None.	As members of parliament, their approval would be needed to start the take-over	To gain power in Munich government, generally critical of SWM which is seen as controlled by SPD
SEE1	Employees' council of Munich Sewage Works Munich (MSE Personalrat)	Legal representation of the entire staff of MSE		Rather influential, close to public services union, most representatives are union members	Protection of employees rights and continued municipal control and ownership of MSE, independence of commercial pressures
SEE2	Gesamtpersonalrat	Combined representatives of entire Munich city municipal staff	No formal one, but Indirectly by supporting MSE staff in their opposition to take-over and cross-border leasing	Very powerful employees' representation	Protection of employees rights and continued municipal control and ownership of public services
SM	Münchner Abendzeitung, Münchner Merkur	One social democrat, one conservative daily newspaper		Information and influence on public opinion	



SU1	ÖeTV München (now ver.di)	Local section of national public services union	No formal one, but representing employees' interests in Munich public water and wastewater services	Influential partner of MSE staff and employees' representation, helps to increase public awareness and pressure	Generally in favour of non-commercial approaches to water and wastewater management, strictly opposed to merging public wastewater services with semi-commercial Stadtwerke utility, strictly opposed also to cross-border leasing of wastewater treatment plants
WU1	Stadtwerke München	Municipal utility supplying drinking water, gas and electricity, plus public transport and public baths	Responsible for supplying drinking water, no role in city drainage and wastewater disposal	Powerful actor in municipal politics, itself 100 per cent controlled by municipal government, with mayor being Aufsichtsratsvorsitzender	Merger with Sewage Works Munich (MSE) to integrate entire urban water cycle
WU2	Munich sewage works (MSE)	Fully municipally controlled and run wastewater management and urban drainage unit	Responsible for wastewater collection, treatment and disposal, as well as urban drainage (storm water management)	Limited independent powers, directly linked to municipal government, which is involved in daily management	Continued stable and long-term reliable wastewater management free of commercial elements

5 Episodes

Of the six potentially important episodes in the Munich urban water sector during the past 15 years, two were investigated in detail because they are most typical and instructive of decision-making processes in the German public services sector. The other four episodes are briefly described below, but not discussed in depth. They all concern legal reorganisations within the water or the wastewater undertaking and did not involve any change of ownership. The most recent one, the unbundling of water supply services into three independent commercial units in the course of general utilities' unbundling in 2003/04, would have been of interest, but occurred too late for this project and couldn't be thoroughly researched due to time constraints (for a brief account however, see chapter 5.1.1.3 below).

5.1 Important episodes and decisions in Munich in the recent past

Due to the complete separation of water supply and wastewater management in Munich, the two services are dealt with in separate chapters 5.1.1 and 5.1.2.

5.1.1 Water supply

Three major episodes are discernible for the water supply system in the Munich case study. They are interlinked and follow similar lines of reasoning and justification. A fourth potential episode was the proposal in about 1994 to privatise SWM in its entirety. Because of the brevity of this episode (it wasn't more than a single unsuccessful proposal for a parliamentary resolution tabled by the liberal minority in the Munich municipal parliament), and because it didn't have the slightest chance of being accepted, it is not treated as a separate episode.

5.1.1.1 From Public Utility to Public company (GmbH) (1996)

In 1996, the legal organisation of Stadtwerke München (SWM) was changed from municipal utility (Eigenbetrieb) to a public company (GmbH), officially to improve the position towards contractors (public utilities are tied to certain limiting rules that don't apply to public companies). Consultants A.T. Karney were hired from 1996 to 1999 to adjust the internal structure and organisation of Stadtwerke München to the private legal character. However, most of their proposals never substantiated because the next change of organisational structure followed swiftly (see 5.1.1.2).

5.1.1.2 Gas, Water and Electricity Combined in one Separate Company (1999)

With electricity liberalisation being required by new EU legislation, SWM had to change the legal character of their electricity branch. To resolve the situation and to secure their shares in the electricity market, gas, water and electricity activities were combined in a new daughter company of SWM (SWM-Versorgungs-GmbH, SWM Utilities, one hundred per cent publicly owned), with an independent management, however still responsible to SWM management. The non-profitable public swimming pools, hitherto an integral part of the water supply unit, remained with the parent SWM company. Apart from fulfilling legal requirements, the city also had a direct financial interest in separating water, gas and electricity from other services (such as public transport). A separate contract between the gas, water and electricity company and the city allowed defining more reliable revenues for the city from these activities.

5.1.1.3 Unbundling and Dividing up the Water Supply Unit (2004)

Officially as a reaction to the EU's Unbundling Directive – requiring separation of electricity production from networks – the SWM management undertook a further restructuring of SWM-Versorgungs-GmbH as of 1 January 2004. One uniform company was divided up into three legally independent companies, with the water supply system being fully subject to the cut-up. There is no legal requirement to do so for water, although city representatives have consistently named alleged future EU regulations on the water sector as an additional motivation for this step. As a result, only water production, i.e. the maintenance and protection of wells, remains a water-only company. This 'water production company' sells water to the second new unit, a 'distribution and networks company' that leases the assets of water, electricity and gas infrastructure from the SWM parent company. Water sales and accounting are finally found in the third chunk of the new structure, responsible for water, gas and electricity marketing. The water supply system, an integral unit for over 120 years, has thus been separated into three units with merely commercial relations. By amalgamating both distribution and sales with the much more commercially orientated energy units, the water infrastructure is likely to become increasingly under pressure to improve financial efficiency. There is considerable internal unease about this step not only amongst employees, but also in middle management responsible for water, who fear that the loss of the traditional integral structure of water in one hand will lead – at least in the medium term – to a severe weakening of service quality.

There is no obvious reason for changing the organisational and legal structure of water supply, yet the option to exclude water from the restructuring was not considered. SWM executive director Mühlhäuser has stressed in the press that he is strictly against privatisation of the Munich water supply system, and in case of outside pressure he would prefer to 'return water networks to the city'. It isn't entirely clear what he means by that, yet such a step would potentially involve returning the water supply infrastructure to a separate municipal company or even a municipal utility. It is an interesting question why this option hasn't been chosen in the first place, particularly given the constant rhetoric by mayor and SWM management to secure water in public hands.

It should be noted that no additional management has been installed for the moment. The same three directors as SWM, Kurt Mühlhäuser and his two sub-directors Reinhard Büttner and Stefan Schwarz will run the three new companies. The situation is however expected to change soon, leading to a potential further alienation of the separate utility daughter companies.

5.1.2 Wastewater Management

Of the three potential episodes, the two most interesting ones have been investigated in detail (see chapter 5.2).

5.1.2.1 From Municipal Department to Public Utility (1993)

Like most wastewater operations in Germany, Stadtentwässerungswerke München (SEW, now Münchner Stadtentwässerung, MSE) has been managed directly by a department of the municipal administration from its beginnings 120 years ago until 1993. The decision to give the wastewater unit more independence was mainly guided by the theme of reduction of municipal debt. At the time, municipal debt had reached a level that was regarded as unacceptable and non-viable. By separating the relatively high debts of the wastewater operations (caused by the necessity to finance the ongoing maintenance and upgrading of infrastructure) from the city budget, the situation became less visible, and less embarrassing for the administration. Euro convergence criteria also had a moderating effect on municipal debts and will have played an indirect role in this decision.

Clearly, there wasn't much opposition (if any) to this step at the time. The city profited from reducing its visible debt, the managers from increased operational discretion and flexibility. The effects on employment

of this change of legal form and the consequent internal changes of organisation and structure remain to be investigated.

5.2 The detailed Episodes

5.2.1 Attempted Take-over of Münchner Stadtentwässerung by Stadtwerke München

In 1999, Stadtwerke München (SWM) had developed plans to incorporate Munich wastewater operations (Münchner Stadtentwässerung, MSE, a municipal utility historically independent of Stadtwerke) into SWM and to merge it with the SWM water unit. However, this plan was not made known to the public. When rumours reached the press in July 1999, the mayor publicly denied that the city was supporting such plans, but confirmed SWM's intentions.

The city official (Stadtrat) responsible for municipal utility MSE expressed his opposition to these plans as well as the public services union ÖTV. Their main argument was that a merger with the more commercially oriented Stadtwerke would also increase commercial pressures on MSE, leading to a mid-term decrease in service quality and environmental performance. An additional argument was that wastewater tariffs might be raised under commercial management. The press supported most of these arguments, and voiced fierce criticism of SWM's managing director.

The public attention to the issue put pressure on SWM to defend and justify their take-over proposition. The management in a letter to the mayor pointed to economic synergies and greater commercial viability of a combined water/wastewater unit. No allegations were made of a better functioning of the urban water sector by combined operations of water and wastewater units. From SWM's reasoning it is obvious that the prime motivation for the intended take-over was increasing turnover and income for SWM, not an improvement of service quality.

In August 1999, the mayor inaugurated a parliamentary working group (working group 'bundling of municipal networks under Stadtwerke Munich'), which was expected to be a preparatory move to approving the take-over intended by SWM. Shortly afterwards, MSE management sent a detailed fact sheet to the mayor outlining the merits of an independent, city-owned, non-commercial wastewater unit. It laid out why commercial pressures were particularly harmful to wastewater operations that required long-term planning and financing. It stressed that environmental and social objectives in wastewater collection and disposal were more likely achieved by a municipally owned and controlled utility (Eigenbetrieb) than by a branch of a commercially operating Stadtwerk. For instance, the high (bathing water) quality of the local river Isar was argued to be a result of the additional performance of MSE under municipal control. Such a direct expression of the political will to go well beyond the legally required standards of wastewater treatment would not have been possible under commercial operations. Finally, it is shown from countrywide statistics that despite excellent performance and infrastructure maintenance, wastewater tariffs in Munich were far lower than the German average, and had in fact had been lowered recently.

At the same time, public services union ÖTV announced to exhaust all legal means to prevent the take-over. The press picked up the issue, again with a rather negative image of SWM as a greedy commercial giant. In early September 1999, the second largest party in Munich's parliament (CSU, conservatives) publicly declared its opposition to the take-over plans. The support from two groups who seldom have common goals (public services union and CSU) considerably strengthened the campaign against the proposition.

In late September 1999, the mayor stopped SWM's take-over plans. He proclaimed in the local press that 'no further municipal company will be privatised needlessly' ("ohne Not privatisiert"). Water supply and wastewater services hence continued separate operations under Stadtwerke (SWM) and municipal utility (Eigenbetrieb, MSE) until the present day.

5.2.2 Proposed Cross-border Leasing of Wastewater Plants

In the course of 2003, numerous proposals for cross-border leasing (CBL) of public assets came to the centre of public scrutiny in Germany – with an increasingly hostile reaction from citizens who perceived the outcomes of these arrangements to be hardly predictable and hence risky. In 1998/99, however, hardly anyone knew of this option, nor of its details or potential risks, and so several major CBL arrangements were proposed and completed in many cities.

Munich was no exception. In 1998, an arrangement for leasing out Munich’s wastewater treatment plants to US investment banks and investors was proposed, mainly initiated by the municipal finance department and the MSE’s financial director, with approval obviously by the mayor. Soon, public services union ÖTV and MSE’s staff representation asserted their opposition to these plans, mainly based on the political and financial risks of the arrangement and its long duration of at least 30 years. Criticism was also picked up by members of the municipal parliament, with the additional argument that exploiting US tax loop-holes which were intended for an entirely different purpose, was detrimental to the image of public undertakings and might undermine tax honesty.

In April 1999, it became clear that the legal basis of the specific form of cross-border arrangement envisaged by the city (LoLi arrangement) was about to be cancelled by the US senate. At this point, last minute attempts were undertaken by consultants, city officials and the MSE financial director to quickly and tacitly complete the deal in spite of strong public opposition. The mayor who was informed of these activities by MSE staff representation stopped these attempts.

A second initiative for a CBL arrangement (this time termed ‘lease to service contract’) was started mainly by the city’s finance department and MSE’s financial director in February 2000. This time, MSE management demanded MSE’s staff representatives to give up their opposition to the deal because of the lower risk. Staff representatives did agree to abstain from ‘emotional campaigning’, but reserved the right to inform the public. When the deal was about to be finalised in October 2000, public services union ÖTV sent out a press release stating strong opposition to the project because of its unpredictable outcome. The press picked up most of the critical points, particularly that future difficulties may occur jeopardizing the public nature of MSE as a whole, and that the city may eventually be faced with massive additional costs.

The vote on the CBL project was taken off the municipal parliament’s agenda soon after these press reports. No other CBL proposal concerning MSE has been made since.

5.3 Factors

External factors with an influence on decision-making have in both episodes mainly been economic and political, with environmental, social and technological considerations playing a minor role. This reflects the recent and ongoing trend to an increased commercialisation of hitherto purely political processes: Where historically, the water sector was governed by principle political considerations, the effect of strained municipal budgets has introduced finances as an over-arching new paradigm influencing all decision-making. In addition, international legislation and supra-national economic agreements have entered the decision sphere also at the municipal level.

Table 5.1: Relevant external factors in the Munich case study episodes

Factor	Description	Associated with actor/s*		
P 01	City mayor need to clarify the decision process by making the issue public and undertaking a thorough investigation	WU 01	WU 02	PE 02
P 02	Concerns that CBL contract may eventually lead to forced privatisation of MSE	SEE 01	SU 01	PE 04
P 03	Concerns to potentially lose control over wastewater undertaking to US investors	SEE 01	SU 01	PE 04
P 04	Making use of a US tax exemption loop-hole by a public undertaking is	SEE 01	SU 01	PE 04

	regarded as politically not justifiable			
P 05	US congress intends to cease the legal basis of LiLo cross border leasing contracts	PE 02	PE 03	SEE 01
Ec 01	Intention by Stadtwerke Munich to increase turn-over and profits by taking over wastewater management activities from the city	WU 01	WU 02	
Ec 02	Worries that commercialisation of wastewater management will lead to decreased service quality due to lower investment in infrastructure maintenance and lower number of staff	SEE 01		
Ec 03	Increasing city budget by cash received as payment for cross-border leasing	WU 02	PE 03	
Ec 04	Concerns about potential financial difficulties and risks of cross-border leasing contract	SU 01	SEE 01	PE4
S 01	Fear of loss of jobs	SU 01	SEE 01	
Env 01	Worries that commercialisation of wastewater management will lead to less environmental protection	WU2	SU1	SEE1

* Note: For the abbreviations of the associated actors, please refer to the respective tables in the Excel document on Munich.

5.4 Outcomes

The outcome of both investigated episodes was that the status quo was preserved. This is a rather sign of political stability than of inflexibility. The pressure exerted to affect changes (cross-border leasing in one case, a merger of water and wastewater activities in the other) was considerable. The reason why the proposals failed to be adopted was that more convincing arguments could be laid out and framed as public interest versus commercial efficiency and profit. Preserving a status quo may sometimes be the result of simply avoiding a decision. In the two episodes reported here, this is clearly not the case. One outcome is a renewed assertion of stable and sound public services, another an increased public interest in water matters. The latter is proven by the formation shortly after these episodes of Wasserallianz München (WAM), an independent NGO mainly trying to influence, moderate and control local water policies.

5.5 Summary of case study episodes

Table 5.2: Overview of Munich episode characteristics

Episodes	Part of which decision process?	Covering events:	What (description)	Who (actors)	Why (factors)	When
Ep1	D1	Ev1 to Ev24	Take-over of MSE by SWM	SWM, MSE, mayor, municipal parliament, public services union, staff representatives	Budgetary pressures, commercialisation of the water sector, ideological debate	May to September 1999
Ep2	D2	Ev1 to Ev21	Cross-border leasing of wastewater treatment plants	SWM, MSE, mayor, municipal parliament, public services union, staff representatives, financial consultants	Budgetary pressures	August 1998 to October 2000

5.6 Collating episodes

Table 5.3: Options considered in the Munich episodes with associated actors and positions

Option	Description	Actors supporting –(opposing)
Op1	Merger of Stadtwerke München (SWM, water, gas, electricity) and	SWM management (MSE Staff representation)

	Münchner Stadtentwässerung (MSE, wastewater)	(Local and regional public services union) (Civil servant resp. for wastewater, Baureferent)
Op2	Continued separate operations of water and wastewater	MSE Staff representation Local and regional public services union Civil servant resp. for wastewater, Baureferent SWM management
Op3	Cross-border leasing	MSE financial director Civil servant resp. for municipal finances - Stadtkämmerer (MSE Staff representation) (Local and regional public services union)
Op4	No cross-border leasing	MSE Staff representation Local and regional public services union (MSE financial director) (Civil servant responsible for municipal finances – Stadtkämmerer)

6 Participation and sustainability in decision making

6.1 Participation

Public participation followed very similar patterns in both episodes studied at Munich.

Both episodes were initiated by internal moves, not by official politics or parliamentary motions. Information of the public was not undertaken although both decisions were likely to have resulted in tangible financial consequences for consumers and the general public. In one episode, even MSE staff, though directly affected by the decision to incorporate MSE into SWM, only found out about the intended changes through ‘rumours’.

What may seem from abroad as an exceptionally secretive process is in fact rather the norm in the German water sector as well as wider public services policies. Even major developments, such as a change of ownership or legal form, are seldom communicated to the public, or if so, after decisions are irreversible or have effectively been taken. German public undertakings often still act according to the traditions of Prussian authorities, i.e. to take their decisions under exclusion of the public. The public is still regarded by many public servants, politicians and public services managers as an unwanted element of disturbance.

Under those circumstances, non-governmental bodies such as environment or development NGOs, unions or professional associations have an important role to play. They make public and comment on the issues that otherwise would never become known to the wider public, and effectively create openness and public accountability. Both Munich episodes are a graphic example of this mechanism. Without the help of the local public services union, both propositions – the incorporation of MSE into Stadtwerke as well as the cross-border leasing deal – would have been adopted in closed circles, with no information, leave alone active participation of the public.

In both episodes, the press finally reacted to the warnings and press releases of union and MSE staff representatives making the internal decision-making processes visible and known to the wider public. Without the union’s insistence to publicise these issues, however, it is likely the press wouldn’t have picked these water-related issues up. This again points to a general problem of the water sector in Germany. The general public, including the press, regard water policies as a matter mainly of engineers and public authorities, and show little interest for decisions in this field.



There is however, a change of atmosphere to be felt in the water sector lately, in Germany as a whole, but also in Munich. Citizens get together in initiatives scrutinising water policies, with a particular eye on privatisation and liberalisation moves. The formation of a water alliance in Munich (Wasser Allianz München, WAM), made up of environment and development NGOs and local representatives from the public service union, but mainly of concerned citizens without any former NGO affiliation, can be regarded as a direct outcome of the episodes investigated in the Munich case study. It seems people are no longer willing to wait until the local newspaper reports that another important decision on their water or wastewater company has been taken. They want to be involved and actively demand information and participation rights.

6.2 Sustainability

The assessment of the sustainability of decisions that have not been taken is a difficult task. In case of one of the two Munich episodes – the proposed incorporation of Münchner Stadtentwässerung (MSE) into Stadtwerke München (SWM), episode 1 – it is however clear that from an environmental, social and also technological point of view, the preservation of the status quo is more sustainable. Evidence from other cities reveals that increased commercialisation in an otherwise intact wastewater undertaking leads to a tendency to under-invest. While this tendency cannot be fully ruled out under city control either, in the case of Munich this is not a major concern.

At the time, union representatives had described the case as a decision between common good and commercial interests, and this seems an apt characterisation. It can however only be speculated, how far commercial and cost-effectiveness attitudes of a wastewater unit integrated into Stadtwerke München (SWM) would have affected every-day operations and future strategies of wastewater management. Most likely, the wastewater unit would have been subjected to the same unbundling exercise the water supply unit is currently experiencing (see chapter 5.1.1.3).

The potential outcome of a decision in favour of a cross-border leasing contract for the Munich wastewater plants (episode 2) is even more speculative. While direct consequences would be purely financial, the outfall from a failing contract could be considerable and undermine not only the existence of the respective company, but also destabilize entire city budgets. Hundreds of such contracts have been signed throughout Germany, but due to the duration of the contracts of at least 30 years, a thorough impact assessment isn't possible today. It should not be under-estimated however that a leasing contract involves partial and temporary transfer of ownership for a long period of time, and potentially reduces flexibility to sell or otherwise make use of the respective assets. In that respect, the decision in Munich not to sign a cross-border leasing contract certainly generated more future stability, reliability and flexibility for wastewater operations than the expected one-time payment from the arrangement would have.



7 City in Time

7.1 Financing and organisation

Drinking water supply: It was only in 1883 that Munich started its own central water supply (for earlier forms of urban water supply, see table 1 below). There was obviously no discussion about private involvement. The city immediately created two new departments under the construction department, one responsible for 'supply', one for 'abstraction'. Much of the construction works was undertaken by the city itself.

Wastewater: In 1875, the city of Munich hired British engineer J. Gordon to devise a package solution for urban drainage and wastewater disposal according to the Frankfurt model. The first 25 kilometres were built until 1885, with mainly the Frankfurt based construction firm Philipp Holzmann responsible for the works. According to the contract, the construction firms were responsible for the sewers, including eventual damage during construction to buildings and existing underground infrastructure (e.g. drainage pipes, water and gas pipes). Critical steps such as the mixing of cement and the watering of bricks for sewer construction were tasks reserved to municipal workers to maintain highest building standards.

In 1885, the city decided mainly on financial grounds to drop Gordon. The magistrate (city parliament) felt that the city's public servants had now acquired enough knowledge to undertake sewer construction by themselves. Thus a new city department on 'urban drainage' was founded and a public servant engineer given the responsibility for planning, construction, operation and maintenance of the sewer system.

7.2 Technical considerations

Most of the discussions concerning water and wastewater revolved around technical issues. In terms of drinking water, there was a lengthy debate in the 1880s about the best-quality and most reliable source. In terms of wastewater, the question of connection of WCs to the sewer system was debated heatedly for over 30 years.

Two major publications exist covering the historical periods from the beginning of the city to 1983, the year marking the 100th anniversary of water supply and municipal sanitation in Munich. The most important facts extracted from these publications are found in the tables below. However, these publications lack sufficient detail mainly on the question of financing. Ownership issues have never been a topic until the 1990s.

Table 7.1: Overview of important dates in the history of Munich's water sector

1318	First mention of a public well in Munich
1300-1900	Water supply from a large number of public draw-wells (bucket wells), cooperatively maintained (Genossenschaftsbrunnen)
1467-1471	Construction by the city of a first (wooden) water main from outside the city (Gasteig), connected to "Klafferbrunnen" on the Rathaus square (historical city centre). This well provided water continuously.
1400-1904	Parallel construction of water supply for the court of the princes of Bavaria (Hofwasserversorgung)
1511	Construction by the city of first well house (Brunnhaus) or water house (Wasserhaus) where water was pumped into a small reservoir to keep up pressure in the piping system leading to the continuously running public wells. The river drove the machine pumping the water into the reservoir current (man-power drove it in times of drought).
1500-1860	Continuous construction of new wells and extension of wooden piping system.
From 1555	Private connections to water supply become possible (because more water was available than needed for public wells). Private households obtained a continuous flow of water, mostly into the courtyard of the house. A one-off connection fee was paid and established the right to continuous water flow "for ever".
1555	First city official named to be responsible for water abstraction, pipe system and public wells (municipal well master)
1600s	Municipal well master (Stadtbrunnmeister) established as a fixed municipal institution with a statute
1791	City realises that one-off payment is not sufficient, from now new connections were paid for annually. "Old rights" remained untouched, i.e. these households continued to be supplied for free (by 1950, 282 households still held this right to free water, a further 77 paid half).
1867	Last wooden pipes replaced by metal
1874	Decision by the city to change water supply to more reliable and pristine water sources, and to build a sewer system
1875	Two supply systems exist in Munich: Stadtwerke system (60 public wells, 2203 household connections), and the court's water supply (9 public wells, 960 household connections). 57 per cent of Munich's households were without running water (4219 of 7382), 3516 had private wells (latter figure refers to 1885). Situation not stable because abstraction and piping system was still at the technical level of 1600s. Often, pipes froze in winter, and generally, the quantity supplied was as inadequate as the quality.
1880	After assessing numerous options, decision to tap sources in Mangfalltal, about 30 km S of Munich
1881-1883	First phase of Mangfall project with first pipe leading to reservoir (Hochbehälter Deisenhofen)
1883	Marks the beginning of the central water supply under city control and ownership, with two separate units for abstraction (Quellfassung) and supply (Versorgung) [similar to recent unbundling of water supply]
1893-1902	Second phase, extension of wells, second main pipe to reservoir Deisenhofen
1904	Municipal and court water supply systems are combined
1902-1912	Third phase, additional abstraction wells (Reisach)
1910	The two units for abstraction and supply are merged to become the municipal unit for water supply, under the municipal construction department
1924-1931	Fourth phase with new abstractions, a further reservoir (Kreuzpullach), and a connection between the two reservoirs.
1937/38	Water (and gas) supply become municipal utilities, each financially independent units
1949	Further groundwater from near Munich (Schotterebene) is tapped near Trudering
1949-1982	Fifth phase, further abstraction wells, second connecting pipe between reservoirs Deisenhofen and Kreuzpullach
1952-1954	Third groundwater abstraction from near Munich (Schotterebene) is tapped near Deisenhofen
1953	Decision to extend water supply by drilling new wells in Loisachtal, near Garmisch in the Alps
1972	Third additional groundwater supply from Schotterebene near Arget (secured supply during 1972 Olympics)
1976	Major reorganisation of water works. The sub-units for abstraction and for distribution are restructured, with two new sub-units for construction and for operations and maintenance (each responsible for the entire system). All non-technical units (finances, administration) were removed from the water utility into the directorate of all municipal utilities [most likely a preparatory step for the later establishment of Stadtwerke Munich]
1976-1977	Construction of second major alpine water supply from Loisachtal after more than twenty years of debate with local and administrative opponents. Some quarrels are still ongoing.

Sources:

Hundert Jahre Münchner Wasserversorgung. Stadtwerke München (ed.), München 1983.

Website Stadtwerke München www.swm.de

Table 7.2: Overview of important dates in the history of Munich’s wastewater sector

1811 - 1856	First covered sewers to drain wastewater into Munich’s rivers; uncoordinated, unplanned development
1836	Cholera epidemic, first indications that water cycle may be involved, the physician Max Pettenkofer pleads for a coordinated water supply and drainage system
1854	2936 persons die of Cholera in this year, even the wife of King Ludwig I., Therese
1855	City government is demanded by the Bavarian government to prepare plans for a systematic sewer system
1862	Mandatory connection of rainwater and kitchen water pipes to the sewers. Illegally, faeces from pit latrines are disposed of into the sewer. Strong smells result from that practice. System is regarded as insufficient.
1873	Cholera epidemic with close to 1500 casualties
1875	British engineer J. Gordon is commissioned with elaborating a package solution for Munich wastewater
1876	Gordon’s first comprehensive plan. Major disagreement between Pettenkofer and „Münchner Architekten- und Ingenieursverein“ over connection of latrines to the system. Pettenkofer in favour of connection, architects and engineers in favour of a barrel system to prevent loss of nutrients and groundwater and river pollution (in hindsight it seems they were correct). However, Pettenkofer’s anthropocentric view of getting rid of health threats by simply flushing the city prevailed in the end (and is fully supported by the authors of the 100 year sewerage anniversary publication who ridicule the backward architects and engineers of 1876).
1881- 1885	The first 25 km of the Gordon plan are put in place, another 50 km followed in the years to come.
1885	Marks the beginning of a the legal entity “Stadtentwässerung” with a municipal director becoming responsible for the urban drainage system (Max Niedermeyer)
1890	Official adoption of water closet approach (see above, 1876)
1900	225 km of sewerage canals have been completed, 78 per cent of the population are connected to the system
1926	Completion of first sewage treatment plant (mechanical plus biological digestion in fish ponds). Interestingly, a private law company has built the treatment plant (Mittlere Isar AG), with a 40 per cent of the investment coming from the city
1931	The city of Munich acquires the wastewater treatment plant
1933	90 per cent of the population of 738,000 are connected to the system (428 km long)
1933- 1945	This period has been omitted from the 100-year anniversary publication although much of Munich was destroyed in bomb raids that must have affected the wastewater system. As if nothing had happened, ...
1950	... the sewerage system has grown to comprise 600 km
1957	Begin of the upgrading of wastewater treatment (mechanical, biological, and sludge concentration and digestion)
1973ff	Construction of rainwater retention system next to Olympic Park, 80,000 mcm, costs DM 34 m (€ 17 m)
1979	Introduction of stricter wastewater rules of industry, major reduction of heavy metal contamination of sewage sludge
1980	General drainage concept adopted for next 40 years (predicted total investment DM 4 bn, € 2.05 bn)
1980ff	Construction of a second major rainwater retention system, 44,000 mcm, costs of DM 42 m (€ 21 m)
1984ff	Second major wastewater treatment plant, projected costs DM 512 m (€ 262 m)
1985	Combined sewage sludge and waste incineration begins
1985	Sewerage system comprises about 2000 km of major canals, coverage 97 per cent of population (1,28 million)

Source:

100 Jahre Stadtentwässerung München. 1885- 1985. Ed. Grafisches Atelier M. Lutz and Baureferat City of Munich, 1985.

7.3 Long-term strategic decisions in Munich water history

The table below lays out the most important strategic decisions concerning technology and ownership and organisation in the Munich water history after 1850.

Table 7.3: Selected long-term strategic decisions in the Munich water sector from 1850 to present

Year	Event	Reason	Outcome	Organisational change	Stakeholders
1855 (waste-water)	City ordered by regional government to organise a systematic drainage system	Cholera outbreak in 1854 with 2,936 dead, amongst them the wife of King Ludwig I of Bavaria			<ul style="list-style-type: none"> Regierung Oberbayern



1874 (water)	Decision by city magistrate to investigate a potential change of water supply to better quality and a more reliable water source	Unsatisfactory quality and low reliability of water supply in times of drought	Improved water supply from Mangfalltal (alpine region to the South) goes into operation (24.04.1883). Fierce opposition in Mangfalltal against groundwater abstraction	Setting up of two distinct municipal authorities to organise water supply (infrastructure, pipes) and abstraction	<ul style="list-style-type: none"> • Municipal government • Physicians • Scientists • Engineers • Mangfalltal property owners
1875 (waste-water)	British engineer J. Gordon commissioned to draw up plan for drainage system	Renewed cholera outbreak in 1874 with almost 1,500 killed	After fierce discussions if WCs should be connected to sewers, a first section of Gordon's system (incl. WC) is built (1881-1885)		<ul style="list-style-type: none"> • Municipal government and administration • Hygienists/doctors • Gordon (engineer)
1883 (water)	Decision to set up unit for water meter maintenance	Siemens water meters had been introduced already in 1850/52	Water is charged by measured consumption		<ul style="list-style-type: none"> • Municipal administration
1885 (waste-water)	Decision to establish an "urban drainage unit" in the municipal administration	Task to construct a city-wide system was regarded as needing concerted municipal supervision	City employs an engineer as first head of section "urban drainage" (Stadtentwässerung)		<ul style="list-style-type: none"> • Municipal government • Municipal administration
1908 (water)	New Bavarian water law stipulates that water abstractions are subject to authorisation	More administrative control to prevent excessive groundwater abstractions	Immediately, property owners in Mangfalltal use the new law to sue the city of Munich. Finally, courts decide that city may continue using the groundwater		<ul style="list-style-type: none"> • Mangfalltal property owners • Municipal administration of Munich • Bavarian government
1910 (water)	Decision to combine water supply and abstraction units into one common authority	Need to improve performance and to take responsibility for entire water cycle		One municipal water supply authority formed as unit of the works department	<ul style="list-style-type: none"> • Municipal administration
1920s (waste-water)	Decision to install wastewater treatment	Severe pollution problems in river Isar whose quality is too bad for some industrial uses	Completion of first mechanical treatment plant with biological treatment in fish ponds (1926)		<ul style="list-style-type: none"> • Municipal administration • Water authorities of Bavaria
1937/38 (water)	Decision to remove utilities from direct municipal management	?	Water (and gas) supply units become municipal utilities, each financially independent companies		<ul style="list-style-type: none"> • Municipal administration
1970s (waste-water)	Decision to construct storm water retention basins	During rains, increased water flows caused sewers to overflow into rivers, leading to severe river pollution	Huge investments in the construction of underground storm water basins in the 1970s and 1980s		<ul style="list-style-type: none"> • Municipal administration • Water authorities
1976 (water)	Major reorganisation of Munich water works	Preparatory step for incorporation of water supply company into Stadtwerke	The sub-units for abstraction and for distribution are restructured, with two new sub-units for construction and for operations/maintenance (each responsible for the entire system).	Major shift of responsibilities: all non-technical units (finances, administration) were removed from the water utility to an overall directorate of municipal utilities	<ul style="list-style-type: none"> • Municipal administration

Sources:

100 Jahre Stadtentwässerung München. 1885- 1985. Ed. Grafisches Atelier M. Lutz and Baureferat City of Munich, 1985.

Hundert Jahre Münchner Wasserversorgung. Stadtwerke München (ed.), München 1983.

Website Stadtwerke München www.swm.de



8 Annexes

Annex A: Water system profile Stadtwerke München

All data in the tables below are based on the year 2002, or where relevant on the 31/12/2002. Where available, important data are also given for 2003.

DATA	CONCEPT
SERVICE DATA (in 2002, as of 31/12/2002 where relevant)	
Type of water supply system <ul style="list-style-type: none"> • Direct distribution 	One single choice can be replied as “yes”
Total population (no) in service area 1.4 million	Resident population within the service area
Population served (no) 1.4 million	Size of resident population directly served within the service area
Supply area (km ²) 310 km²	Area that can or is intended to be served by the network

PHYSICAL ASSETS	
WATER RESOURCES (in 2002, as of 31/12/2002 where relevant)	
Annual abstraction capacity (m ³ /a) 250,000,000 m³/a	Maximum yearly allowance of water abstraction for water supply, based on the availability of raw water resources under normal climatic conditions (i.e. the value used in design and abstraction licence if any)
Daily abstraction capacity (m ³ /d) 1,050,000 m³/d	Maximum daily allowance of water abstraction for water supply, ditto
Reliable annual yield of sources (m ³ /a) 149,000,000 m³/a	Estimated annual reliable yield of water resources under adverse (drought) conditions (i.e. the value used in supply/demand balance evaluation)
Reliable daily yield of sources (m ³ /d) 1,050,000 m³/d	Estimated annual reliable ditto
IMPOUNDING RESERVOIR STORAGE (in 2002, as of 31/12/2002 where relevant)	
<ul style="list-style-type: none"> ▪ Number (no) none 	Number of impounding reservoirs
<ul style="list-style-type: none"> ▪ Total capacity (m³) not applicable 	Volume of impounding reservoirs that can be used for water supply
WATER TREATMENT PLANTS (in 2002, as of 31/12/2002 where relevant)	
<ul style="list-style-type: none"> ▪ Number (no) ▪ none, all water is supplied without any treatment 	Number of treatment plants
<ul style="list-style-type: none"> ▪ No treatment (m³/d) 1.4 million 	Water delivered to users without any treatment
<ul style="list-style-type: none"> ▪ Disinfection only (m³/d) 0 	Water delivered to users with disinfection only
<ul style="list-style-type: none"> ▪ Conventional treatment (m³/d) 0 	Water delivered to users from conventional treatment plants
<ul style="list-style-type: none"> ▪ Advanced treatment (m³/d) 0 	Water delivered to users from advanced treatment plants

PHYSICAL ASSETS (2002)	
TRANSMISSION AND STORAGE TANKS/SERVICE RESERVOIRS (2002)	
<ul style="list-style-type: none"> ▪ Number (no) 3 	Number of transmission and distribution storage tanks (customer storage excluded)
<ul style="list-style-type: none"> ▪ Total capacity (m³) 306,000 m³ 	Volume of transmission and distribution storage tanks (customer storage excluded)
PUMPING STATIONS (WATER SUPPLY) (2002)	
<ul style="list-style-type: none"> ▪ Number (no) ▪ none, water flows freely from alpine sources without 	Number of pumping stations of the transmission and distribution system (customer pumping systems excluded)



any pumping requirement	
<ul style="list-style-type: none"> Total capacity (kW) (Gesamtkapazität in kW) 0 	Total nominal power of the transmission and distribution system pumps (customer pumping systems excluded)
TRANSMISSION AND DISTRIBUTION NETWORK (2002)	
Mains lengths (km) 3,400 km	Transmission and distribution mains length (service connections excluded)
SERVICE CONNECTIONS (WATER SUPPLY) (2002)	
Total number of service connections (no) 133,500	Number of service connections
Total number of metered service connections (no) 133,500	Number of metered service connections
SERVICE CONNECTIONS (WASTEWATER) (2002)	
Total number of www-service connections (no)	Number of www-service connections

CONSUMPTION (2002)	
Daily average input (m ³ /d) 271,000 m³/d (98,800,000 m³/a)	Annual input of the transmission system
Total per capita consumption (l/capita/day) 193 l/c/d	(Daily average input – exported water) / population served

CUSTOMER SERVICE (2002)	
Existence of system to record all customer complaints (yes/no) yes	Existence of registers that record total number of verbal and written customer complaints, enabling nature of complaints to be determined by scrutinising individual entries
Existence of formalised system to record all customer complaints for service quality monitoring and assets management purposes (yes/no) yes	Existence of customer complaints recording and data processing system that is used for resolving customer complaints, monitoring of service quality and performance and assets management planning
Existence of a guaranteed standards scheme (yes/no) yes	Existence of guaranteed standards scheme that establishes the rights of customers, including at least: minimum service pressure at the delivery point; maximum time to get a new connection and to repair an existing one; maximum time of written responses; appointment times to attend customers' premises

FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant)	
OPERATING REVENUES	
Sales revenues (EUR/a) SWM total : 1.980billion Water only 111,7 million	
Work in progress (EUR/a) not released	
Capitalised costs of self-constructed assets (EUR/a) not available	The summation of the amounts in each of the below mentioned cost categories that have been incurred in the construction of new or rehabilitated assets.
Other operating revenues (EUR/a) SWM total: 91.4 million (2002), 288.9 (2003) Water only: not released	
TOTAL OPERATING REVENUES (EUR/a) SWM total: 115.3 million (2002), 237.1 million (2003) Water only: not released	The summation of the above mentioned amounts

FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant)	
OPERATING COSTS (source: all data from SWM annual report 2003)	
OPERATIONAL COSTS	
Imported (raw and treated) water costs (EUR/a) not applicable	BULK SUPPLY IMPORTS: total payments, for imported bulk supplies. (imported raw water and/or imported treated water).
Energy costs (EUR/a) 269,300 (water only?)	POWER: all energy costs for water supply – electricity and fuel for motive machinery.



<p>External services costs (EUR/a) SWM total: 311.9 million (2002), 418.2 million (2003) Not released for water alone</p>	<p>OUTSOURCING: outsourcing of technical or administrative services, such as consultants, contractors undertaking, operational tasks, meter reading and accounting fees. SOFTWARE LICENCES AND TECHNICAL SUPPORT: license fees on computer software and technical support by software companies. ASSOCIATED COMPANIES: costs of associated companies not included in other items. THIRD PARTY SERVICES: operating costs of providing water services to third parties (other than the regulated water supply function) that are not included in other items.</p>
<p>Leasing and rentals costs (EUR/a) Leasing- und Mietkosten ? n.a.</p>	<p>Payments for leasing or renting premises, vehicles, mobile and fixed plant and equipment.</p>
<p>Purchases of consumables and other materials for maintenance and repair (EUR/a) SWM total: 718.9 million (2002), 706.4 million (2003) Not released for water alone</p>	<p>MATERIALS AND CONSUMABLES: all materials and consumables other than energy, that are not in HIRED AND CONTRACTED SERVICES and which are required for operation of sources, treatment plants, and transmission and distribution systems.</p>
<p>Taxes, levies and fees (EUR/a) SWM total: 54.8 million (2002), 169.9 million (2003) Not released for water alone</p>	<p>Any operating license paid to a governmental or municipal authority, abstraction charges, local authority rates.</p>
<p>Exceptional earnings and losses (EUR/a) N.a.</p>	<p>Any exceptional income or expenditure from donations, investment subsidies, compensations or adjustments related to sales / writing off of fixed assets.</p>
<p>Other operating expenditures (EUR/a) SWM total: 257.1 million (2002), 274.0 million (2003) Not released for water alone</p>	<p>OTHER DIRECT COSTS: any other operating costs (but excluding interest and taxation, on an aggregated basis). GENERAL AND SUPPORT EXPENDITURES: the aggregate direct cost of GENERAL AND SUPPORT ACTIVITIES (manpower costs excluded) (see section .2 for definitions). CUSTOMER SERVICES: costs directly associated with customer services that are not included in previous items, related to customer accounting, reading of meters, debt recovery, costs of disconnections, customers' enquiries and complaints handling. SCIENTIFIC SERVICES: costs directly associated with scientific and laboratory services and with the monitoring of quality that are not included in previous items. OTHER BUSINESS ACTIVITIES: costs directly associated with other business activities that are not included in previous items, except for cost depreciation. DOUBTFUL DEBTS: charge/credit to the profit and loss account for bad and doubtful debts.</p>
<p>INTERNAL MANPOWER COSTS (EUR/a) SWM total: 504.0 million (2002), 515.4 million (2003), n.a. for water alone</p>	<p>EMPLOYMENT COSTS: the sum of the total manpower costs of permanent and temporary personnel, including employment-related social costs and benefits paid by the employer.</p>
<p>TOTAL OPERATING COSTS (EUR/a) / SWM total: 1.793 billion (2002), 1.724 billion (2003) n.a. for water alone</p>	<p>The summation of the above mentioned amounts</p>



FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant)	
DEPRECIATIONS (EUR/a) Depreciation (referred to the book values) SWM total: 182.8 million (2002), 175.4 (2003) Not released for water alone	COST DEPRECIATION: cost depreciation charge on tangible fixed assets AMORTISATION OF INTANGIBLE ASSETS: any amortizations or other reduction in the balance sheet valuation of intangible assets, such as goodwill. THIRD PARTY SERVICES: cost depreciation on assets relating to third party services, together with any infrastructure renewal charge for infrastructure assets relating to third party services.
E.B.I.T. = O.I. (EUR/a) SWM total: 80.7 million (2002), 178.4 million (2003) (source: SWM annual report, calculated from gross income minus financial income)	Operating income = Earnings before interests and taxes
NET INTEREST (EUR/a) SWM total: 61.0 million (2002), 49.7 million (2003) Water only not released	NET INTEREST: Net cost of short, medium and long-term loan capital (INTEREST EXPENSES – INTEREST INCOME).
E.B.T. = G.I. (EUR/a) SWM total: 115.3 million (2002), 237.1 (2003) Water only not released	Gross Income = Earnings before taxes
TAXES (EUR/a) SWM total: 54.8 million (2002), 169.9 million (2003)	All taxes and levies on gross income related to water supply activities. <i>Tax costs and levies strictly connected with plants operation (such as sewerage charges on treatment wastes, charges for water abstraction, pipeline and concession charges, environmental levies, water control authority charge etc) have to be regarded as operational costs and included in TAXES, LEVIES and FEES (Running costs)</i>
NET INCOME (EUR/a) SWM total: 60.5 million (2002), 67.2 million (2003) (source: SWM annual report 2003, calculated from gross income minus taxes)	Earnings after interests and taxes

FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant)	
INVESTEMENTS (for 2002, as of 31/12/2002 where relevant)	
Investment (EUR/a) SWM total: 242.1 million (2002), 389.4 million (2003) SWM production (gas, electricity, water, district heating): 50.5 million (2002), 159.0 million (2003) SWM supply (gas, electricity, water, district heating): 98.6 million (2002), 112.2 million (2003)	Cost of the investments over the last three years /



TARIFF SYSTEM (2002)	
Kind of tariff applied fixed price per m³	- Fixed - Variable (depends on the number of m consumed)
Average supply water tariff for direct residential consumption (EUR/ m ³) 1,15	Average tariff, excluding public taxes
Total average water charges for direct consumption (EUR/ m ³) Not released by SWM upon enquiry. Calculation from metered consumption and average price may be incorrect since bulk and industrial consumers have different tariff.	Annual water sales revenue from residential, commercial, industrial, public, institutional and other customers (exported water excluded; public water taxes excluded) / (total annual authorized – exported water)

PERSONNEL	
Total personnel SWM total: 7317 (2002), 7191 (2003) (cp. 7661 in 2000) (source: SWM annual reports 2003, 2001) Water only: circa 2600 (source: public services union ver.di 08.12.2003)	Number of full time equivalent employees
Management and support Not released by SWM upon enquiry.	Number of full time equivalent employees dedicated to administration, strategic planning, legal affairs, personnel, public relations, quality management and other supporting activities
Financial and commercial personnel Not released by SWM upon enquiry.	Number of full time equivalent employees working in financial and commercial activities
Customer service personnel Not released by SWM upon enquiry.	Number of full time equivalent employees working in customer service activities
Technical services personnel Not released by SWM upon enquiry.	Number of full time equivalent employees working in technical services
Salary average (EUR/year) per category Not released by SWM upon enquiry	Euro per year per each of the above categories



Annex B: Water system profile Stadtentwässerung München

All data in the tables below are based on the year 2002, or where relevant on the 31/12/2002.

DATA	CONCEPT
SERVICE DATA (in 2002, as of 31/12/2002 where relevant)	
Type of water supply system <ul style="list-style-type: none"> • Bulk water supply • Direct distribution • Bulk supply and direct distribution 	One single choice can be replied as "yes"
Type of wastewater system <ul style="list-style-type: none"> • Collection • Treatment • Collection and treatment YES 	One single choice can be replied as "yes"
Population (no) <ul style="list-style-type: none"> ▪ Water supply ▪ Wastewater ABOUT 1.500.000 	Resident population within the service area
Population served (no) <ul style="list-style-type: none"> ▪ Water supply ▪ Wastewater ABOUT 1.486.000 	Size of resident population directly served within the service area
Supply area (km ²) <ul style="list-style-type: none"> ▪ Water supply ▪ Wastewater 310 km² City + 300 km² Region 	Area that can or is intended to be served by the network

PHYSICAL ASSETS	
WATER RESOURCES (in 2002, as of 31/12/2002 where relevant)	
Annual abstraction capacity (m ³ /a)	Maximum yearly allowance of water abstraction for water supply, based on the availability of raw water resources under normal climatic conditions (i.e. the value used in design and abstraction licence if any)
Daily abstraction capacity (m ³ /d)	Maximum daily allowance of water abstraction for water supply, ditto
Reliable annual yield of sources (m ³ /a)	Estimated annual reliable yield of water resources under adverse (drought) conditions (i.e. the value used in supply/demand balance evaluation)
Reliable daily yield of sources (m ³ /d)	Estimated annual reliable ditto
IMPOUNDING RESERVOIR STORAGE (in 2002, as of 31/12/2002 where relevant)	
▪ Number (no)	Number of impounding reservoirs
▪ Total capacity (m ³)	Volume of impounding reservoirs that can be used for water supply
WATER TREATMENT PLANTS (in 2002, as of 31/12/2002 where relevant)	
▪ Number (no)	Number of treatment plants
▪ No treatment (m ³ /d)	Water delivered to users without any treatment
▪ Disinfection only (m ³ /d)	Water delivered to users with disinfection only
▪ Conventional treatment (m ³ /d)	Water delivered to users from conventional treatment plants
▪ Advanced treatment (m ³ /d)	Water delivered to users from advanced treatment plants
WASTEWATER TREATMENT PLANTS (in 2002, as of 31/12/2002 where relevant)	
▪ Number (no) 2	Number of ww-treatment plants
▪ No treatment (m ³ /d) 0	Wastewater disposed without any treatment
▪ Mechanical treatment (m ³ /d) 0	Wastewater disposed after mechanical treatment
▪ Conventional treatment (m ³ /d) 0	Wastewater treated with conventional systems
▪ Advanced treatment (m ³ /d) 498.000 m³/d Average	Wastewater treated with advanced systems

PHYSICAL ASSETS (2002)	
TRANSMISSION AND STORAGE TANKS/SERVICE RESERVOIRS (2002)	
▪ Number (no)	Number of transmission and distribution storage tanks (customer storage excluded)
▪ Total capacity (m ³)	Volume of transmission and distribution storage tanks (customer storage excluded)
PUMPING STATIONS (WATER SUPPLY) (2002)	
▪ Number (no)	Number of pumping stations of the transmission and distribution system (customer pumping systems excluded)



<ul style="list-style-type: none"> Total capacity (kW) 	Total nominal power of the transmission and distribution system pumps (customer pumping systems excluded)
PUMPING STATIONS (WASTEWATER AND STORMWATER) (2002)	
<ul style="list-style-type: none"> Number (no) 116 	Number of pumping stations of the ww-collection system (customer pumping systems excluded)
<ul style="list-style-type: none"> Total capacity (kW) 700MW Annual Consumption 	Total nominal power of the ww-collection system pumps (customer pumping systems excluded)
TRANSMISSION AND DISTRIBUTION NETWORK (2002)	
Mains lengths (km)	Transmission and distribution mains length (service connections excluded)
SEWERAGE NETWORK (2002)	
Mains lengths (km) 2.343 km	Wastewater and storm water sewer mains length (service connections excluded)
SERVICE CONNECTIONS (WATER SUPPLY) (2002)	
Total number of service connections (no)	Number of service connections
Total number of metered service connections (no)	Number of metered service connections
SERVICE CONNECTIONS (WASTEWATER) (2002)	
Total number of www-service connections (no) 141.000	Number of www-service connections
CONSUMPTION (2002)	
Daily average input (m ³ /d)	Annual input of the transmission system / 65
Total per capita consumption (l/capita/day)	(Daily average input – exported water) / population served / 65
TREATED WASTEWATER (2002)	
Daily average treated wastewater (m ³ /d) 498.000 m ³ /d	(Annual treated wastewater – imported wastewater – exported wastewater) / 65
Total per capita treated wastewater (m ³ /d) 0,335 m ³ /d (Including Industrial Wastewater)	Daily average treated wastewater / population served
CUSTOMER SERVICE (2002)	
Existence of system to record all customer complaints (yes/no) YES	Existence of registers that record total number of verbal and written customer complaints, enabling nature of complaints to be determined by scrutinising individual entries
Existence of formalised system to record all customer complaints for service quality monitoring and assets management purposes (yes/no) YES (not yet completed)	Existence of customer complaints recording and data processing system that is used for resolving customer complaints, monitoring of service quality and performance and assets management planning
Existence of a guaranteed standards scheme (yes/no) YES	Existence of guaranteed standards scheme that establishes the rights of customers, including at least: minimum service pressure at the delivery point; maximum time to get a new connection and to repair an existing one; maximum time of written responses; appointment times to attend customers' premises
FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant) wastewater only	
OPERATING REVENUES	
Sales revenues (EUR/a) 231.012.382,--€/a	
Work in progress (EUR/a) 0,00 €	
Capitalised costs of self-constructed assets (EUR/a) 12.313.585,--€/a	The summation of the amounts in each of the below mentioned cost categories that have been incurred in the construction of new or rehabilitated assets.
Other operating revenues (EUR/a) 25.282.735,--€/a	
TOTAL OPERATING REVENUES (EUR/a) 268.611.702,--€/a	The summation of the above mentioned amounts
FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant) wastewater only	
OPERATING COSTS	
OPERATIONAL COSTS	
Imported (raw and treated) water costs (EUR/a)	BULK SUPPLY IMPORTS: total payments, for imported bulk supplies. (imported raw water and/or imported treated water).



Energy costs (EUR/a) 3.768.722 € (Wastewater only)	POWER: all energy costs for water supply – electricity and fuel for motive machinery.
External services costs (EUR/a) 18.979.453 €	OUTSOURCING: outsourcing of technical or administrative services, such as consultants, contractors undertaking, operational tasks, meter reading and accounting fees. SOFTWARE LICENCES AND TECHNICAL SUPPORT: license fees on computer software and technical support by software companies. ASSOCIATED COMPANIES: costs of associated companies not included in other items. THIRD PARTY SERVICES: operating costs of providing water services to third parties (other than the regulated water supply function) that are not included in other items.
Leasing and rentals costs (EUR/a) 2.048.070 €	Payments for leasing or renting premises, vehicles, mobile and fixed plant and equipment.
Purchases of consumables and other materials for maintenance and repair (EUR/a) 5.878.136,27 €	MATERIALS AND CONSUMABLES: all materials and consumables other than energy, that are not in HIRED AND CONTRACTED SERVICES and which are required for operation of sources, treatment plants, and transmission and distribution systems.
Taxes, levies and fees (EUR/a) 12.372.595 €	Any operating license paid to a governmental or municipal authority, abstraction charges, local authority rates.
Exceptional earnings and losses (EUR/a) 138.851 €	Any exceptional income or expenditure from donations, investment subsidies, compensations or adjustments related to sales / writing off of fixed assets.
Other operating expenditures (EUR/a) 22.201.723 €	OTHER DIRECT COSTS: any other operating costs (but excluding interest and taxation, on an aggregated basis). GENERAL AND SUPPORT EXPENDITURES: the aggregate direct cost of GENERAL AND SUPPORT ACTIVITIES (manpower costs excluded) (see section .2 for definitions). CUSTOMER SERVICES: costs directly associated with customer services that are not included in previous items, related to customer accounting, reading of meters, debt recovery, costs of disconnections, customers' enquiries and complaints handling. SCIENTIFIC SERVICES: costs directly associated with scientific and laboratory services and with the monitoring of quality that are not included in previous items. OTHER BUSINESS ACTIVITIES: costs directly associated with other business activities that are not included in previous items, except for cost depreciation. DOUBTFUL DEBTS: charge/credit to the profit and loss account for bad and doubtful debts.
INTERNAL MANPOWER COSTS (EUR/a) 44.965.071 €	EMPLOYMENT COSTS: the sum of the total manpower costs of permanent and temporary personnel, including employment-related social costs and benefits paid by the employer.
TOTAL OPERATING COSTS (EUR/a) 110.806.002 €	The summation of the above mentioned amounts

FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant)

INVESTEMENTS (for 2002, as of 31/12/2002 where relevant) **wastewater only**

Average investment 40.491.000 €

Cost of the investments over the last three years /



TARIFF SYSTEM (2002) wastewater only	
Kind of tariff applied variable	- Fixed - Variable (depends on the number of m consumed)
Average supply water tariff for direct residential consumption (EUR/ m ³)	Average tariff, excluding public taxes
Average wastewater tariff for direct residential consumption (EUR/ m ³) 1,56 €/m³ (wastewater), additionally if relevant 1.30 €/m² (rainwater)	Average tariff, excluding public taxes Only about 50.000 citizens of Munich have to pay for the treatment of storm water (e.g. 29.000.000 € of the sales revenues result from rainwater treatment).
Total average water charges for direct consumption (EUR/ m ³)	Annual water sales revenue from residential, commercial, industrial, public, institutional and other customers (exported water excluded; public water taxes excluded) / (total annual authorized – exported water)
FINANCIAL INFORMATION (for 2002, as of 31/12/2002 where relevant)	
DEPRECIATIONS (EUR/a) Depreciation (referred to the book values) 82.079.988 €	COST DEPRECIATION: cost depreciation charge on tangible fixed assets AMORTISATION OF INTANGIBLE ASSETS: any amortizations or other reduction in the balance sheet valuation of intangible assets, such as goodwill. THIRD PARTY SERVICES: _ cost depreciation on assets relating to third party services, together with any infrastructure renewal charge for infrastructure assets relating to third party services.
E.B.I.T. = O.I. (EUR/a) 75.725.712 €	Operating income = Earnings before interests and taxes
NET INTEREST (EUR/a) 85.835.817 €	NET INTEREST: Net cost of short, medium and long-term loan capital (INTEREST EXPENSES – INTEREST INCOME).
E.B.T. = G.I. (EUR/a) –10.110.104 €	Gross Income = Earnings before taxes
TAXES (EUR/a) 38.459 €	All taxes and levies on gross income related to water supply activities. <i>Tax costs and levies strictly connected with plants operation (such as sewerage charges on treatment wastes, charges for water abstraction, pipeline and concession charges, environmental levies, water control authority charge etc) have to be regarded as operational costs and included in TAXES, LEVIES and FEES (Running costs)</i>
NET INCOME -10.148.563 €	Earnings after interests and taxes EBT - Taxes



PERSONNEL	
Total personnel 815,57	Number of full time equivalent employees
Management and support personnel 247,48	Number of full time equivalent employees dedicated to administration, strategic planning, legal affairs, personnel, public relations, quality management and other supporting activities
Financial and commercial personnel 25,28	Number of full time equivalent employees working in financial and commercial activities
Customer service personnel 60,00	Number of full time equivalent employees working in customer service activities
Technical services personnel 482,81	Number of full time equivalent employees working in technical services
Salary average (EUR/year) per category Management and support 13.644.391,- EUR Financial and commercial 1.393.770,- EUR Customer service 3.307.998,- EUR Technical services 26.618912,- EUR	Euro per year per each of the above categories