Water sector evolution scenarios: the case of Europe

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Abstract

The purpose of this article is to identify possible scenarios for the evolution of the European water supply and sanitation sectors (WSS) in the next 15 years, on the basis of empirical knowledge of its dynamics. These are: tendered market, tendered market with strong regulation, administrative regulation, outsourcing, direct public management and community management. In order to do this, the authors examined the main characteristics of the sector that influence the way the sector is likely to evolve, the nature and scope of the WSS markets in Europe, as well as the role of the main actors involved in this sector (whether the European Union’s institutions, public and private operators, or national regulators). This detailed analysis resulted in the framing of the main drivers of change affecting the whole sector in Europe, as well as three macro-storylines along two paradigms, a liberalized and a non-liberalized environment, that were at the basis of the identification of the water “scenarios”. The authors have finally tested the plausibility of the scenarios in selected European countries.

Keywords: Europe; Liberalization; Management; Sanitation; Scenarios; Water supply

1. Introduction

Without doubt, the water sector, that is, both distribution and sewerage, has been undergoing profound changes over the past 20 years (Winpenny, 1994; Barraqué, 1995; Haarmayer, 1998; Nunes Correia, 1998; Lee, 1999). We have tried to explain this transformation by a combination of two trends, which – quite paradoxically – mutually reinforce one another, namely growing environmental concern on the one hand and liberalization on the other (Finger & Allouche, 2002). Despite these major changes, it is generally agreed that the water sector displays the four following main characteristics.


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First, the sector displays features of a strong natural monopoly. Duplication of the water and sanitation infrastructure is too costly and makes no sense in economic terms (Littlechild, 1988). There can therefore be competition only for managing the natural monopoly, which usually takes the form of competition for the market. However, new ways to introduce other forms of competition are currently been put into place, whether comparative competition (i.e. benchmarking) or competition in the market via third party access (Cowan, 1997; Gordon-Walker & Marr, 2002).

The second main characteristic pertains to the local nature of water supply and sanitation (WSS). The transport of water may raise important quality problems. Furthermore, from a purely economic point of view, it does not make sense to transport water over a long distance. It has indeed been estimated that transport costs per 100 km represent about 50% of the wholesale cost of water (compared to 5% for electricity and 2.5% for gas) (Gee, 2004).

Third, the elasticity of demand (i.e. the variability in demand resulting from a price change) for primary uses of water is close to zero since these are essential needs of the user and few substitutes are available (EUROMARKET, 2003).

The final main aspect pertains to the fact that WSS have strong merit and quasi-public good characteristics. In other words, water services are important for society, irrespective of whether consumers are willing or capable of paying for them or not, and that their social benefits exceed the private benefits. Strong positive and negative health and environmental related external factors, as well as the fact that water is essential for life and for economic activity, makes water services a prime example of “general” or “public interest” activities. The provision of this type of service must therefore respect the principles of universality of access, quality of service and price equity (Luís-Manso & Finger, 2008).

All the characteristics above in fact influence the way the sector is likely to evolve. The aim of this article is to come up with different water sector evolution scenarios for Europe within the next 15 years. By the term “scenario” we mean internally coherent and credible stories about alternative futures. There are different pathways whether one introduces more competition or not and how the institutional and regulatory framework defines the general interest obligations. Furthermore, the perception and acceptance of these changes by civil society in general and by strong interested actors within the sector also shape the way the scenarios have been conceived.

These scenarios are the result of a three-year research project funded by the European Commission, involving nine academic and non-academic partners, and of which the chair MIR (Management des Industries de Réseau - in English, Chair, Management of Network Industries) at EPFL is the academic director. The paper is structured into three main parts. The first part presents an outlook of the water sector in Europe today in terms of EU policies, operator strategy, national policies, as well as the limits and scope of the WSS markets. The second part focuses on the main drivers of change that helped construct the scenarios. Finally, the last part describes the six main scenarios identified, as well as their respective storylines.

2. Outlook of the water sector in Europe today

In this section, we describe the main actors and issues that are currently affecting the evolution of the WSS nowadays, namely:

1 For more information on the project, see the following website: http://www.epfl.ch/mir.euromarket.
an analysis of EU policies in the water sector (notably the Water Framework Directive), as well as other policies which could affect the sector (e.g. policies on the liberalization of network industries, policies on competitive bidding, as well as competition policies);

an analysis of national policies in the water sector, highlighting in particular national differences related to water supply and sanitation management;

an analysis of the existing and potential water market in Europe, covering both water supply and sanitation; and

an analysis of the operators’ strategies, covering the main types of operators from private multi-utilities to publicly owned municipal entities.

2.1. European policies

Three fields have been identified, where existing European policies could have an impact on WSS services: (1) standards in drinking water and sanitation systems, (2) management of the natural resource (by way of WFD), and (3) liberalization and services of general interest.

European water policy has been developed since the beginning of the 1970s, along with the first Environmental Action Programme. Three generations of directives can be distinguished: first generation (1973–1988), second generation (1988–1995) and the third generation (1995 to today). The first generation of directives mainly focused on the protection of water used for human activities. Measures were taken regarding drinking water standards and the control of emissions of particular harmful substances (Hansen & Kraemer, 2000). The basic driving forces behind this first generation of directives were twofold: first, the harmonization of environmental law to remove trade barriers and to avoid distortion of competition and second the protection of public health (Kallis & Nijkamp, 1999). A second generation of directives (1988–1995) completes the initial phase with more specific measures (e.g. purification of urban wastewater and limitation of manure spreading) following a command and control approach (EUROMARKET, 2003). The third generation corresponds to a change of paradigm in the environmental field in that there is a shift from treating water along sector specific preoccupations towards a more integrated resources approach. The Water Framework Directive (WFD) is the result of this new policy.

Overall, one can see that drinking standards are becoming more and more stringent. These policies have many consequences; besides environmental considerations, they have led to the management of more complex technology and expertise for the water industry, as well as the need for more capital in order to finance the required investments. These trends have obvious effects on the water sector and may have had fostered private sector participation.

The WFD initiates a reform of the European water policy and today is the main instrument of this policy. It aims to develop an integrated European water policy through the harmonization of objectives for the sector, even if the policy instruments remain decentralized. Its main objective is to achieve and maintain a good ecological status for all waters (by 2015). The main motivation for the reform was the integration of all the fragmented EU water-related directives into a common structure that respects the principles of subsidiarity and integrated management of the resource.

The WFD, which was highly influenced in its wordings by the directorates general (DG) Environment, places particular importance on environmental issues. It does not give any indication of the way the sector is organized. As a matter of fact, European treaties are neutral regarding questions related to the
ownership (of infrastructures and operators) and the structure of the sector. Each country therefore remains responsible for legislation on the ownership, types of management, institutional structures and distribution of competences. The only exception is if the management of the service is delegated to a third party – in this case, the principles and rules on public procurement and concessions must be respected (European Commission, 2004a).

Despite the neutrality of the treaties, in the last couple of years the European Commission has directly or indirectly approached questions related to the structure of the sector, namely its liberalization. Nonetheless, some conflicts of interest have emerged between different directorates general (DGs). On the one hand, DG Competition and DG Internal Market focus their operation on the services dimension of the sector and its competitiveness. On the other, DG Environment privileges management of the water cycle and the protection of the resources.

These different approaches are found in several documents of importance to the sector, for example in what concerns the application of the European Competition Policy to the sector. On the one hand, the WFD considers water supply to be a service of general interest (SGI) and therefore not subject to the rules on competition. On the other, both the Internal Market Strategy (European Commission, 2003a) and the Green Book on Services of General Interest (European Commission, 2003b) consider water supply to be a service of general economic interest (SGEI) and, therefore, subject to the rules contained in the EU Treaty (European Community, 2002), in particular the rules on competition [article 86(2) of the Treaty]. These divergences have contributed to intensify the debate on the liberalization of the sector.

It is important to mention that the aforementioned documents, as well as other initiatives that might influence the opening of the sector to competition, have encountered strong resistance from the European Parliament and some European countries. In reaction to the liberalization waves from DG Competition and DG Internal Market, these actors promote the modernization of the existing systems.

Last, the liberalization policies in other network industries (e.g. electricity, telecoms, postal services) do not seem to have had an influence on the WSS sector so far, mainly because of the WSS’ specificities such as the central role of local authorities and the structure of natural monopoly, but also the nature of the good and the particular focus on quality. Overall, one can see that the EU does not have any official position regarding models of management or liberalization and has not yet designed any official policies or legislation in this regard. The position of the EU on this issue thus remains very open, although there are a few signs that competition issues in the water sector will certainly be on the EU agenda in the coming years as we will see in the second part of this article.

2.2. National policies

National policies have been considerably influenced by the European water legislative framework. This is probably the reason why in most of the countries analysed in detail in the EUROMARKET project (Belgium, Germany, Spain, England and Wales, France, Italy, the Netherlands, Portugal and Sweden) the major policy objectives are converging, especially so in the ecological and economic field.

In economic terms, the principle of cost recovery is recognised in the different national legislations. This principle is going to be implemented (in line with the WFD) by means of full-cost pricing, that is, the consumer pays all the related costs in his or her water bill. In practice, the principle is not yet strictly implemented (i.e. maintenance of public subsidies). Furthermore, ecological protection of water resources is a priority in all countries. The objective of a good status for both surface and groundwater,
as stated in the WFD, is already transposed to national legislation in most countries. The major
differences in European national legislation are found in the social field (e.g. price affordability,
improvement of the standard of living). Overall, it appears that the dominant policy rationale is currently
the environmental one (EUROMARKET, 2004c).

2.3. WSS market

The overall WSS market may be divided into three inter-related markets: the market for customer
transactions, the market for supplier transactions and the market for water resource transactions.

The market for customer transactions may be best classified as a natural monopoly, of which the asset
type being investigated determines the monopolistic extent. Actors in this market are the management
entity that executes the service provision, the responsible entity that bears the responsibility for the
service provision and the customers for which the service is provided. The market for customer
transactions involves the supply of two main services (water supply and sanitation) which consist of a
myriad of specific sub services (e.g. drainage, foul sewage, trade effluent, potable water supply, non-
potable water supply, water for fire-fighting, interruptible or standby water supply, peak or off peak
water supply, connection to network).

The most viable type of competition in the customer transactions market is identified as competition
for the market. It is more difficult to introduce competition in the market, enabling customers to choose
between several management entities via geographical insets, third party access (including through the
alteration of historic property rights), cross border supply, or via product/service substitution by
customers (typically self-supply by large non-households or rural households).

In providing WSS services the management entity must undertake a number of specific activities.
These can be defined as individual, possibly contestable, services or products that together represent the
building blocks or inputs of the WSS service. These inputs can either be provided by the management
entity directly or purchased from a supplier of inputs in the market for supplier transactions. They either
relate to the day-to-day operational management of the service or to the infrastructure required to deliver
the service. Three main actors are active in this market, namely the management entity, the suppliers of
inputs and the competition authority.

The market for supplier transactions is typically competitive, while the degree of competition varies
between different product service market segments. Competition in the market for supplier transactions
can be introduced as it involves various operational inputs, including contestable service contracts and
turnkey infrastructure provision. It is sometimes seen as a viable surrogate to competition in the market for customer transactions. There is also a possibility for comparative competition within
the market for supplier transactions, for example market testing to assess transfer prices undertaken by
the responsible entity or the competition authorities (i.e. incentive-based regulation of conduct).

The third market, the water resource transactions involves the ownership and possible
trading of rights to abstract water and discharge wastewater into the water environment. In this sense the
“buyer” is the management entity, the “supplier” is the entity that owns the water resources and the
“regulator” is typically a national or regional body. In Europe “supplier” and “regulator” often are
the same body. The state retains the right to allocate the resource between uses and fix environmental
standards (on the basis of European Directives).
Competition in this occurs when there is a need to free up existing abstraction licenses and “consents to discharge” through some form of trading, time limitation and/or regulatory intervention. The introduction of any type of competition in this market has proved to be very difficult because the risk of market failure is severe enough to restrict any wide scale adoption of liberalizing measures (EUROMARKET, 2004a).

2.4. WSS operators

There are more than 30,000 water operators in Europe. The majority of the European population (about 55%) is supplied by public companies, followed by private (about 35%) and mixed owned (almost 10%) operators. Regarding the size of operators providing water services, almost 50% of the population is supplied by medium sized operators (i.e. supplying between 100,000 and 10,000,000 inhabitants). Small operators, who are the majority in nominal terms, supply about 35% of the population and, finally, large operators account for approximately 15% of inhabitants (EUROMARKET, 2004b).

According to our analysis, one could distinguish the business strategies of operators into three types: small, medium and large. Indeed, only size seems to influence operator strategy compared to ownership, scope and segments of the market. Let us then look at the current strategies of these different categories of operators.

In many European countries, small operators usually take the form of municipal services or municipal companies. These companies provide both WSS, and even other services such as electricity and gas. The main objective of these operators is to deliver an efficient supply of water of a reliable quality, at an adequate pressure, at a reasonable price. Overall, there is no real specific strategy for small operators. However, there is a sort of perceived mission that small local public operators have towards consumers (with regard to quality of services), which in fact can be interpreted as a form of strategy to counter larger groups. Finally, the perception of profit is also largely absent or, in other words, different compared to other types of companies (e.g. large private operators).

Medium operators have been mainly the result of the concentration of small public operators in the form of multi-municipal companies, association of municipalities and, in some cases, the creation of public holdings. The aim of this relatively new type of company has been to search for the optimal size so as to exploit scale economies, as well as to allocate efficiently European funds. Amongst medium public operators’ non-core business one can consider the provision of other environmental services, such as urban waste and energy. In fact, entities that have traditionally been publicly owned and managed on a municipal basis are becoming genuine commercial entities able to operate outside their initial regions. Nonetheless, for all of them, the initial market remains the most important in terms of population served and revenues.

For large operators, although one can identify common characteristics in terms of strategy among these operators, there are also important differences most probably explained by the dominant management models and water market restructuring policies in their domestic markets. Among the common characteristics of these operators is that they are listed in the stock exchange, which creates considerable pressures in terms of financial results. Indeed, all these operators have implemented the same type of business model, pertaining to the provision of a public service yet remaining profitable. All large (private or mixed) operators in the WSS sectors have international activities across different countries and even different continents. Nonetheless, for all of them, the European market remains the most important. Another important aspect is the prevalence in terms of importance of the domestic
market. Furthermore, all large operators have developed a multi-utility approach. For large multi-utility groups, the WSS sectors are part of a diversification strategy whose purpose is to lower the risk of relying too extensively on one sector. Moreover, the WSS sectors are also seen as more stable compared, for instance, to electricity and gas since competition in the former sectors is less fierce, which therefore enables long term financial stability.

Many operators perceive that the water sector as not very competitive. In the few cases where operators feel some competitive pressures, these are mainly related to pricing and technology and not to attracting clients neither to gaining markets. In terms of new entrants, the water sector cannot be considered very dynamic. In many cases and certainly owing to a certain search for stability, contract renewals are always to the advantage of the initial operator and this is true whether one considers public or private operators.

Furthermore, the majority of companies active in the water supply and/or sanitation sectors are active in all segments (i.e. collection, treatment, distribution, maintenance of infrastructures and billing). Water and sanitation companies are therefore strongly vertically integrated. However, in some countries and for some segments (e.g. water supply in Spain), liberalization processes have opened up (parts of) the market.

A specific and successful strategy of many operators is the public–private partnership (PPP) strategy, based on sharing the risks and responsibilities between operators and public institutions. Water services remain the final responsibility of the public institutions yet under the effective management control of the operator. Regarding the regulatory context, water operators consider that environmental norms are the most important aspect that the EU promotes (and should keep on promoting), even though these are perceived as the most difficult demands to fulfil. Moreover, most operators believe that the regulatory context will become, in the medium term, even more rigid.

Having looked at the main characteristics of the water sector and the role of its major actors nowadays, let us now identify the main drivers of change.

3. Drivers of change

In Europe, we have identified five major drivers of change in the WSS, namely (1) the pressure to modernize management methods in the public sector, (2) social pressures against liberalization, (3) pressure, by some actors, to replace de facto competition by a more systematic (de jure) approach to competition, (4) financial pressures and (5) technological changes.

3.1. Modernization of the public sector management

We think that one important driver in the European WSS is the pressure to modernize public sector management, which has been called new public management. This pressure has, in turn, several aspects, namely becoming professional, the introduction of new managerial methods and the push by both consumers and politicians for more accountability. Indeed, the growing technicality of the WSS leads to the sector and related activities becoming more professional. Moreover, stricter environmental standards and increasing security concerns make management more complex and more regulated. In parallel, new management methods are being introduced, managerial entities are being given more autonomy and water management is being scaled up more generally.
Today, the European water supply and sanitation sector is certainly still dominated by non-autonomous public entities. However, there is a clear trend, especially in large urban areas, to give these entities more managerial autonomy. Furthermore, a growing number of local public authorities increasingly question local management in favour of larger management structures. This scaling up is also the result of urbanization and subsequent increasing proximity between municipalities. In many EU countries one can therefore observe a rapid growth of inter-municipal structures (e.g. Belgium, France, Germany, Italy) or of new regional structures (e.g. Netherlands, Spain, Portugal, England and Wales).

Finally, there is also a marked concern by both consumers and politicians for more accountability in the sector: corruption scandals in some countries have made consumers more suspicious, and some governments have subsequently tried to involve consumers and consumer associations in the decision making process (e.g. in France or in the UK).

3.2. Social pressure against liberalization

A second driver in the European water supply and sanitation sector is the growing social pressure against liberalization. Recent legislation in the Netherlands (Hall et al., 2004) is illustrative of this pressure. Furthermore, there are many associations that are active at the global and European levels against the liberalization of water services. The main preoccupation of these associations is that liberalization will be done at the expense of low-income consumers. These groups expect that liberalization will cause price increases and a higher rate of water disconnection. Besides, they also argue that water should remain a public good and that it should be recognised as a basic human right.

3.3. Actors promoting liberalization

The third driver in the WSS stems from a series of actors actively promoting liberalization, such as large private operators, some DGs within the European Commission (e.g. DG competition, DG internal market), as well as the World Trade Organization (WTO). DG Internal Market and DG Competition, for example, have explicitly declared that they are in favour of introducing more competition into the sector. This position was echoed in the Internal Market Strategy for 2003–2006, even though the European Parliament voted against including water in this strategy. Underlying here is the debate about whether water services should be considered services of general interest or rather services of general economic interest. Furthermore, the idea of using benchmarking for services of general interest is nevertheless being considered, as is for example emphasised in the EU White Paper on Services of General Interest (European Commission, 2004b).

The General Agreement on Trade in Services (GATS) of the WTO is yet an additional driver for the liberalization of the WSS. Indeed, and despite strong non-governmental protest, water supply remains part of the GATS agenda and if the agreement is accepted, one can expect important implications for the way water supply is currently being managed.

Finally, operators, especially large ones, are also calling for more respect and application of EU competition rules, as they consider having more technical know how and financial capacity (compared to other operators) that will enable them to propose more competitive and attractive bids.
3.4. Crisis of public finances

The fourth but by no means least important driver of change in the sector is the crisis in public finances (European Commission, 2000) and subsequent need to involve the private sector in financing and management of the water supply and sanitation infrastructures. In particular, the high capital needs for wastewater treatment plants are currently leading to private financing. Currently many Northern European countries, such as Austria, Belgium, Ireland, Netherlands and Scotland are encouraging private sector participation in sanitation. And the end of the EU Cohesion Fund in most Southern European countries is also a driver that could increase PSP in the WSS.

3.5. Technological changes

Finally, let us also mention technological changes as a driving force in the water sector. We think here in particular of the technological possibilities for water purification and wastewater treatment, often combined with the possibility of decentralizing or even individualizing such activities (Wilderer & Schreff, 2000; Otterpohl et al., 2002). These technological developments may affect the way the sector is managed and organised in the next 20 years or so.

4. Water sector evolution scenarios

On the basis of this empirical knowledge of the European water sector and its dynamics, we have applied a scenario building exercise. We have selected a number of scenario building tools that are particularly relevant to the scenario building objectives of the EUROMARKET project. The selected tools that form the basis of the EUROMARKET scenario building toolkit are:

- Building the base: historical/trend analyses; causal loop diagrams and STEEP analysis to consider the broader macro-environment;
- Developing outline scenarios: trend extrapolation (to develop initial outline member state scenarios), future imaging (e.g. to map and develop future European liberalization end states) and the scenario cross/probability effects matrix (e.g. to develop alternative outline European scenarios);
- Describing the scenarios: future history via story telling (to develop plausible pathways from the current to the future end state), future event analysis (to assess the storylines formed) and actor analyses of selected critical events (to ensure internal consistency and provide additional detail on the selected scenarios);
- Validating the scenarios: two validation workshops (the first focused on driving forces and the possible EU end states, whilst the second focused on the full first draft scenarios), informal external consultations within eight member states and the introduction of second readers to contest the logic behind the proposed draft final scenarios.

These 12 tools (three in each stage) are drawn from across the main methods used in scenario building (see EUROMARKET, 2005).
These scenarios were constructed along two paradigms, a liberalized and a non-liberalized environment. In doing so, we have identified three macro-storylines:

1. The first one (scenarios 1 and 2) builds on the push by a whole series of actors (public authorities, DG competition, DG internal market, multi-utilities and other private operators) for more competition and private sector participation.
2. The second one (scenarios 5 and 6) builds, in turn, on the opposite push by opponents of liberalization and on a return to direct public or community management.
3. Scenarios 3 and 4, instead, build on the possibility that these two drivers cancel each other out, and that, as a result, the status quo in water supply and sanitation may well continue for the next 15 years.

As a result of this exercise, we have identified six possible scenarios (Figure 1).

Fig. 1. Water sector scenarios.

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The following sections give a short description of each of these scenarios as applied in 2020. We describe the scenarios via story telling in order to develop plausible pathways from the current (i.e. 2005) to the future end states that we call storylines.

4.1. Tendered market (scenario 1)

The first scenario is a tendered market scenario. By tendered market, we mean a competitive supplier market, where suppliers of products, services and financing compete for geographically delimited (i.e. often local) markets. This scenario is therefore characterized by competition for the market.
The market is not unbundled; drinking water markets are integrated (extraction, treatment, transport, distribution and customer service), as are sanitation markets. Most contracts take the form of delegated management contracts, mostly lease, but also concession contracts. Lease contracts are the most typical form of contract since there is no need to expand the network. Large private operators essentially dominate the European market. This can largely be explained by their considerable experience in these particular types of contract (i.e. concessions and lease) but also by their very high technological expertise, their large financial capacity, as well as their management know-how. Of course, some small and medium-sized companies also remain in the European WSS market but these are slowly being taken over by the large ones. All major rules for bidding have been defined under a compulsory EU Directive, which pushes for strong competition by limiting the duration of delegation contracts to a minimum. Furthermore, EU environmental standards are more and more stringent owing to new toxic substances that affect water quality. This, of course, encourages greater technological expertise and these conditions again favour the growth of large operators.

This scenario is the result of two main driving forces, namely the lobbying of trans-national corporations (TNCs), on the one hand, and the desire of the EU to introduce more competition in the sector, on the other. The large TNCs have gradually withdrawn their investments in developing countries and are now mostly focusing on the European market. At the EU level, following the elections in 2009, the EU Parliament and the Commission are more inclined to introduce more competition in the WSS. The main assumption in the storyline is that social resistance will be passive or rather not powerful enough to counteract the liberalization movement.

4.2. Tendered market with strong regulation (scenario 2)

The second scenario is a tendered market with strong regulation scenario: as in the previous scenario, suppliers compete for geographically delimited markets, but in this case such competition is strictly regulated at national or even EU levels. The European market is again dominated by large private operators. Independent regulatory authorities exist in all EU countries and have a mandate to control water prices and the quality of services (drinking water and wastewater treatment quality standards, leakages in networks, water cuts and water shortage). The main particularity of this scenario is that it associates *ex ante* and *ex post* regulation. *Ex ante* regulation is guaranteed through competitive bidding. However, unlike the first scenario, which was mainly concerned with financial efficiency, here the public bids are retained mainly along quality and public service criteria. *Ex post* regulation, which is done by independent regulatory authorities, aims to forge incentives for best performance, that is, the optimal level of effort to reduce cost. This type of regulatory arrangement is clearly innovative and has partly been inspired by the institutional arrangements set up in the 1999 French water law, a law that was never implemented. Additionally, social issues are considered to be an important objective. In this regard, disconnection is forbidden and social funds are put into place across Europe.

The main difference from the previous scenario is that there has been a strong social protest, which has forced the European Commission to introduce amendments to its initial liberalization Directive, obliging national governments to set up independent national water regulators. This social protest is a result of several factors: first, left wing parties have come to power in an important number of EU countries in 2010–2015; second, there is a growing mistrust in delegating water services to private operators and a large number of politicians, but also consumers, are in favour of introducing more controlling
mechanisms; third, the perceived failure of the liberalization of other network industries justifies social demands for more ex post regulation of operators regarding quality standards and service provision, and also for more accountability and information.

4.3. Administrative regulation (scenario 3)

The third scenario is an administrative regulation scenario. The type of operators that exist in the water markets range from private companies to highly autonomous municipal undertakings that work at supra-municipal level. These entities are usually regulated under private law and capital may either be public, private or mixed. Most of these operators have developed a multi-utility approach in order to diversify their activities and therefore are involved in other network industries.

This end state is characterized by benchmarking as the key competition process in the main monopoly markets. Benchmarking can take two polar forms. First, high-powered benchmarking with centralized regulation (pole A) is mainly applied under private monopolies that are subject to a strong external and independent regulating authority at central level, which is also in charge of conducting the benchmarking and of enforcing its results. On the basis of data and information compiled through the benchmarking process, the regulating authorities determine the tariffs, budgets, prices and investments that companies may charge or carry out.

Second, medium-powered benchmarking with decentralized regulation (pole B) prevails in those countries where the organizational structure of the sector is characterized by maintained municipal influence. It comprises extensive information gathering and interrogation of practices by an independent benchmarking authority. Participation is compulsory for all operators. A summarized and condensed selection of this information is published, which exerts public pressure on companies.

The storyline is characterized by pro- and anti-liberalization forces cancelling each other out and by growing administrative intervention. The financial pressure on municipalities led either to the participation of the local private sector or to the creation of autonomous supra-local bodies.

The financial pressure on operators has also increased owing to the use of increasingly sophisticated monitoring equipment and new health/environment assessment techniques that identified an ever-increasing range of new pollutants. Furthermore, the implementation of the WFD also highlighted the need for large investments in sanitation services. All these factors therefore had an important impact on water bills. Consumers, as well as the European Union, therefore pushed for more transparency and it was in this regard that new benchmarking practices were introduced.

4.4. Outsourcing (scenario 4)

In the fourth scenario – called “outsourcing” – European operators have decided to outsource part of their tasks (from metering, via maintenance of the infrastructures, to the handling of the customers’ complaints) to external sub-contractors. A large variation developed in respect of the width of these outsourcing contracts. In this scenario, there is a large variety of management models across Europe ranging from direct public management to full divestiture and including delegated management.
Outsourcing was seen as the major answer to the growing pressure to achieve greater efficiency and innovation, as a result of the growing investment needs in the sector (product of the implementation of the WFD, increasing security concern owing to possible terrorist attacks, etc.) and the higher demands for specialization.

The general success of using outsourcing contracts in other governmental and former utility sectors is an important driver for the implementation of these practices in the water sector. Outsourcing has come to be seen as a promising means of internalizing scale and scope advantages via the use of subcontractors, which service a number of operators and areas. Consultancies and subcontractors with a high expertise offer their services in competition with each other.

The difference from the previous scenarios lies in the fact that there is some dissatisfaction with regulation (regulatory failure, cost of regulation) and that there is growing financial pressure to seek more efficient operations thanks to specialization and technological developments. Such outsourcing is also made possible because numerous suppliers emerge and start to offer corresponding services. Furthermore, and unlike delegation contracts, revenue risks are generally not transferred to the winning bidder.

As a consequence of this outsourcing phenomenon, the EU decided to lower the threshold values beyond which contracts have to be awarded through public tendering. The high level of competency in respect of technological, economic, legal and other issues, from the tendering operators and bidding firms has supported the development of (international) cooperation and generally applicable indicators and benchmarks. As in the energy and telecom sectors, consultants show a tendency to concentrate, combining the different knowledge aspects in the field and reducing the number of players available. Competition authorities have the responsibility for fighting the potential oligopoly tendencies in the supplier market.

4.5. Direct public management (scenario 5)

The fifth scenario, direct public management (DPM), is characterized by no competition apart from traditional procurement arrangements, most notably for specific large-scale infrastructure developments. Contracting out is generally restricted to large turnkey (design and build) infrastructure provision and to the high technology domain. Competition for finance may also be obtained through bond markets.

The local operator is awarded the responsibility for providing integrated water services for the community, that is, to operate as the only provider. Each operator thus acts as a local monopoly and all of their customers are captive. The ownership of the operator is exclusively public. Its focus is on the efficient provision of a high quality public service for the entire community. The public authority has complete responsibility for the operation of water services, for investments, but also for the relationships with the users.

The most important actors in the sector are the customers and local authorities, which are both operators and regulators. Important controls have been assumed for environmental issues by other authorities, namely at the river basin level. There have been no EU liberalization directives in WSS. EU activity is restricted to the enforcement of public health and environment standards, as well as to non-discriminative measures in procurement contracts. There is no (independent) regulatory authority. The protection of customers’ interests, as well as the guarantee of adequate capacity investment, is assured by public ownership and management of the network. Apart from environmental and drinking water quality issues, which are established at the river basin area, each operator acts as a regulator in its region.

DPM is not strictly a return to the old public management model, as it incorporates various innovations in technology and in management structures (e.g. more flexible accounting standards,
flexibility in work contracts). Moreover, public water operators have modernized their governance structures in order to increase public participation in water management. Furthermore, tariffs are structured according to volumetric charges and disconnections are banned. There are no direct subsidies, except for infrastructure development in isolated and less developed regions. In compliance with the WFD, full cost recovery is implemented.

4.6. Community management (scenario 6)

The sixth scenario is a community management scenario. Basically, communities with an interest (e.g. local communities, agglomerations, users groups, associations of industry and private users) own and manage the water supply and sanitation infrastructure. These communities decide the service level and the corresponding investments.

In community management there is no competition in/for the customer market or for various service inputs, except for some activities (such as design, construction and provision of some services) for which the community does not have sufficient know how and which it decided to outsource. However, contracting out is generally restricted to infrastructure provision or for technological expertise demanding tasks and communities retain strategic control over the entire water system.

The local community does not forcibly operate the whole integrated services, that is, water supply and sanitation services. Normally, sanitation services are managed by individuals (i.e. septic tanks) but new technologies enable some communities to set up a decentralized system for wastewater. Regarding the operation and maintenance of WSS, there are two alternatives: the community may be involved in the day-to-day operation and maintenance or it can delegate this task or some other aspects to a professional. In some rare cases, the operation and maintenance is based on voluntary work.

The institutional arrangements for this particular scenario may vary from voluntary organizations (e.g. user cooperatives) to water management associations formed by landowners, private enterprises or public corporations. Customers may also own a water asset or can contribute to the WSS management through representation on water company boards. Public participation is surely the main distinctive element of this scenario.

Community management differs from the public management model in the sense that community participation includes ownership of the services, cost sharing, operation and maintenance of WSS. It helps to decentralize decisions concerning water services management, by transferring responsibilities to communities. It can be a way to provide effective water management when centralized water provision is not efficient. It can also result from a crisis in public finance, mistrust in the public authorities as managers of water infrastructures, and it is possible because new technological developments allow for more decentralized water production and treatment.

4.7. Implementation in EU member states

As a next step it was important to see to what extent each of these scenarios would actually be plausible in selected European countries. These six scenarios are hypothetical; it is not feasible to imagine that we will end up with a common scenario throughout all Europe (apart from those that consider the existence of EU
directives) and their implementation across Europe will certainly be uneven. Therefore, we may end up with a diversity of scenarios happening at the same time (see Table 1).

The first two scenarios result from a European directive. Their implementation therefore seems quite realistic across Europe. In countries like France, these scenarios would not have profound consequences in that they clearly correspond to the main trends that are occurring in the country. On the one hand, one can see the growth of private sector participation and the shortening of delegation contracts. The first scenario would therefore be a continuation of this trend. On the other hand, corruption scandals and high prices have led to questions about the limits of the delegated management model and some have suggested the creation of regulatory bodies at the national level. This idea was actually taken up under the socialist government of Jospin with a draft water law in 2001 that considered the introduction of a national regulator to control operators and help municipalities in negotiating their contract with public or private operators. This existing trend would therefore clearly correspond to the second scenario identified.

In Spain or in Italy, both scenarios would also be highly feasible. In other countries like Germany, these delegated management scenarios would clearly interfere with the municipal right to self administration and would therefore face severe resistance by some local actors. In terms of regulation (i.e. the second scenario), a current technical association like the German Association for Water, Wastewater and Waste (ATV-DVWK) or the German Association of Gas and Water Experts (DVGW) could assume this role. In countries like the Netherlands, this scenario would be very hard to implement, at least in water supply. Indeed, it is enshrined in Dutch law that drinking water companies that provide water for households should remain in public hands. In wastewater, both scenarios are more likely to occur owing to high financial needs. But the country in which these scenarios would be highly improbable is England since the existing institutional framework is extremely difficult to change. In fact, in both of these end states, it is the public bodies (typically the municipality) which retain the ownership of the assets, which is contrary to the current situations in England and in Wales. Furthermore, a 25-year notice period is required by existing appointees if they are asked to quit their statutory appointments.

Regarding new member states, some countries (Slovakia, Poland, Hungary, Lithuania, Czech Republic) experience important pressure to conform to EU directives on drinking water and wastewater treatment; some have to renew their infrastructure, which is in a poor state (Slovakia, Poland) and the lack of public funds (for example in Poland) leads to the development of concession contracts. Other countries like Cyprus, Lithuania and Malta are still characterized by the quasi non existence of private sector involvement and thus the shift towards delegation contracts is less probable.

<table>
<thead>
<tr>
<th>Countries</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
<th>Scenario 4</th>
<th>Scenario 5</th>
<th>Scenario 6</th>
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<tr>
<td>Belgium</td>
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<td>England and Wales</td>
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<td>France</td>
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<tr>
<td>Germany</td>
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<td>Italy</td>
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<td>Netherlands</td>
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<tr>
<td>Switzerland</td>
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Unlikely (U), Possible (P), Likely (L).
The third and fourth scenarios are probably the most likely ones since they are compatible with several models of management. The third scenario (i.e. administrative regulation) corresponds to the major trends identified across Europe. For example, it introduces the concept of benchmarking rules which is clearly an idea that is being thought about in many countries across Europe. This is the case in Germany where a decision was made by the Bundestag in March 2002 to look at possible ways of modernizing the German water sector, including benchmarking. This potential to introduce benchmarking indicators is also studied in many other European countries. However, in many European countries (Spain for example), this system would require many changes because the regional authorities that have the main competences in regulating water management aspects. Therefore, the central government would have to establish a new legal framework in order to have a more efficient benchmarking system. Furthermore, this third scenario envisages the co-existence of three major competition processes (price cap regulation, benchmarking and competition in the market for large users). The current situation in England and Wales fits this third scenario quite well.

Concerning the fourth scenario, outsourcing may occur in most countries but would certainly be limited to services (such as billing, accounting) and very few countries would unbundle the different segments of the water sector (from the collection to the treatment). As a matter of fact, in many European countries (e.g. France, Germany), the water supply and sanitation sectors are largely vertically integrated. The need for outsourcing could be explained by the need to cope with greater technological complexity. In Switzerland for example, the incentive to make operators more professional has led some small communes to outsource some of their activities to small engineering firms. This can be explained by the reluctance of small communes to bear on an increased legal responsibility following a new federal law on consumable goods.

The fifth scenario concerns direct public management. Public management is clearly the most dominant form of management across Europe. However, there is clearly a trend towards more autonomy and direct public management would be in some ways a return to past practices. The likelihood of this scenario occurring corresponds to a North/South divide. In Southern Europe, this scenario would entail many changes, most notably in France, Italy and Spain. On the other hand, the WSS service provision for seven member states (Austria, Denmark, Finland Luxembourg, Northern Ireland, Republic of Ireland and Sweden), Switzerland, the German sanitation sector and sewage collection in the Netherlands and in Belgium are provided through a direct public institutional arrangement that corresponds to a large extent to the direct public management model. This scenario appears quite unlikely for England and Wales.

The last scenario is probably the most unlikely one, at least at the European level. One could imagine the development of this model in low populated areas as it currently exists in Germany and in Switzerland (Saladin, 2003). One could also envisage the creation of a community management institutional setting in high income urban areas in order to develop sophisticated systems that would increase the quality of water. However, this setting would still be integrated within the larger institutional system for the whole city. Overall, even if a community management model will not substitute other models of management, none of the eight case studies examined (i.e. Belgium, England and Wales, France, Germany, Italy, Netherlands, Spain, Switzerland) has excluded the possibility that community management could emerge as one possible form of institutional arrangement in the countries concerned.
5. Conclusion

The six identified water scenarios, which are based on the likely evolution of the European WSS in the next 15 years, are certainly of great interest for European and national policy makers. Indeed, one could argue that the European WSS, but more largely the global WSS, is clearly at a cross road. In this regard, the role of policy makers is of utmost importance because they will influence the way the sector is likely to evolve.

There have been significant turning points in the last 50 years in the water policy field: in the early 1970s, it was recognized at the international level that environmental preoccupation should be integrated in the formulation and planning of water policies; in the early 1990s, one could identify another policy shift in that water should be recognized as an economic good. The main idea behind this reform was that full cost pricing would enable better conservation of water resources.

Today the underlying question within this global debate is whether water supply and sanitation can be considered like any other network industries and therefore be liberalized. Is water specific or is it just believed to be specific? Could we introduce more competition into the sector? Will the sector finally evolve in the same direction as electricity or telecommunications? These questions are clearly being asked in international political institutions, whether the European Union, or more largely the Bretton Woods institutions and the World Trade Organization. There is still no clear answer and there is a strong debate on this issue.

In this regard, our contribution is to enrich the debate by identifying possible coherent and alternative futures for the sector in the specific case of Europe and the events that might trigger such diverse evolution. However, as we have seen, some of these critical events might be the result of political action so it is essential to analyse the possible implications of each scenario whether in economic, environmental, social, legal and organizational terms. This is the objective of the next step of this European research project.

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