Advice to water management practitioners on competition, efficiency and new business opportunities

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TRANSITIONS TO THE URBAN WATER SERVICES OF TOMORROW

Advice to water management practitioners on competition, efficiency and new business opportunities

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PREFACE

"Business model design is a key decision for a new firm entrepreneur and a crucial – perhaps more difficult – task for managers charged with rethinking an old model to make their firm fit for the future." (Zott/Amit (2010): 216)

The water sector faces several challenges, which may demand a rethink of several important aspects within historically grown, traditional business models. Whilst water and wastewater services had been classical natural monopolies in the past, in the present they experience a rising competition as, for example, economic regulation and benchmark projects increase the efficiency pressure (see TRUST (2014)). Moreover, costs and prices recently have come more and more into focus of public debates across Europe (see Meij et al. (2005), Reif (2002)). Since water and wastewater services are those of general interests (see European Parliament, Council (2000): § 15), the utilities room for manoeuvre seems to be restricted by quality and service requirements. However, the identification of efficiency deficiencies and business niches and their utilization may help to improve economic situation, competitiveness as well as reputation of the utility.

The need for cost-effectiveness and the lack of public funding goes along with the emergence of new business opportunities. Under consideration of customer preferences, the competitive environment and the disassembling of the value chain, new business and organisational models to exploit service and technology niches are reviewed and recommended (e.g. based on price or product differentiation).

This advice for water management practitioners shall help to ensure an adequate handling of the competitive environment in the water sector. Further, we aim to help in the identification of the current level of efficiency within utilities as well as concrete measures for efficiency improvement. Within this report special focus is placed on the role of business niches as well as on the possibilities of implementing business innovations. In this context, the design of enterprise-specific business models and its chances will be discussed.

1. COMPETITION AND EFFICIENCY IN THE WATER SECTOR

The central tension in the water sector is the general distrust of monopoly position of water utilities, since most other former monopoly network sectors like electricity and telecommunication have undergone a radical change. Several measures to raise competition and thereby efficiency within the water sector characterize the last decades and force most utilities to reconsider their way to deal with changed conditions. This section shall briefly present competitive environment in the water sector. Moreover, it will give basic advice on an adequate handling and reaction to the raising competitive and efficiency pressure.

1.1. Dealing with increasing competitive pressure

Due to several sector characteristics, water services are historically natural monopolies. The business is capital-intensive (see Marques (2010): 2) and most of the expenditures are irreversible costs, since they are essential for market entry but useless in case of market exit (see Dierkes/Hamann (2009): 18). The latter combined with natural physical restrictions of each supply area hinder a utility from laying down any desired number of distribution nets. Consequently, it is inefficient for more than one provider to operate in such conditions. This is also reflected in the fact, that certain past efforts of laying a second network system (e.g. in Canada and England) ended up with only one monopoly provider (see The World Bank (1996): 2). As a result, a direct competition *in* the market for the end consumers is usually not present in the water market. Another possible form of direct competition *in* the market is the approach of common carriage. Yet a common network usage precisely in the area of water supply is seen critically due to certain issues, like drinking water quality requirements and possible legal issues. In addition, an adequate determination of costs for common network usage and superior position of a supplier, who due to favourable location can abstract water with lower transport costs and thereby achieve a competitive advantage, hinder from common carriage (see Schwarze (2001): 398; Mankel (2002): 42/43)). This phenomenon is also favoured by less drinking water quality issues due to quality deterioration with long distances.

It remains the fact that end customers usually cannot actively choose between different providers, as it would be the case within a real network opening (see Bouttes/Leban (1995): 128). However, whilst direct competition is nearly absent in the water sector and probably will also not be present in the future, several substitutes for direct competition have recently significantly influenced the competitive environment for water utilities in most European countries.

In particular competition *for* the market, regulation, benchmarking, yardstick competition and retail competition are worth to mention here, albeit not all of these competition models are clearly distinguishable from each other (see TRUST (2014): 12).

Figure 1: Applied substitutes for direct competition

Depending on national law various substitutes for direct competition presented in Figure 1 can be applied. The general advantages and disadvantages of these concepts have been previously presented in TRUST (2014), whereas the following section discusses perspectives that water utilities should consider.

Competition for the market

When companies are bidding for the right to fulfil the water service(s) or parts of it for a given period of time, one speaks of competition *for* the market (see TRUST, 2014; European Commission, 1999). Usually involvement and associated requirements are determined in long-term contracts. Therefore, a potential participation in the bidding process should be accompanied with long-term planning of resources, which is quite difficult (see Balance/Taylor, 2005; Scheele, 2000). The extensive planning is necessary, since resources, costs and prices are highly dependent on the current physical status of the network as well as the structural characteristics and demographical development in the potential new supply area.

Advice 1: New concessions offer the opportunity for growth and thereby the use of economies of scale and size (see also Chapter 2.2.3).

Since water services are very specific businesses, the number of bidders are naturally limited (see TRUST (2014): 17) and, therefore, the prospects of success for the bidding company are generally good.

Regulation

In many countries a specific (economic) regulation for water services has been or will be implemented to overcome problems of missing direct competition. The state or an

responsible authority intervenes by defining rules as well as controlling and supervising the way network industries work beside others to protect customers and promote efficiency (see Marques, 2010). Measures can vary significantly between countries and, therefore, would not be discussed here in detail. However, irrespective of the actual regulation model the controlling and supervising nature of the regulatory authority may typically lead to certain tensions with the operators.

Advice 2: The dialog between regulator and regulated companies is extremely important. Only within a close exchange system weaknesses can be uncovered and solved.

Benchmarking

Price comparisons as well as public debates are dramatically increasing within the water sector. They raise the question whether water utilities operate efficiently enough. Therefore, justifications and explanations are necessary.

In this context, the concept of benchmarking has gained significant attention importance and acceptance in the water sector during the last decades to measure utilities performances (see Carvalho et al. (2012) for an overview of benchmark publications). Basically, "benchmarking is a tool for performance improvement through systematic search and adaptation of leading practices" (Cabrera et al. (2011): 2). Within benchmarks, which can be obligatory or non-obligatory, appropriate performance indicators of several best similar utilities are collected and assessed, whereas the improvement usually stays in the task pane of the utility. Depending on the overall target, metric benchmarkings with a rather holistic nature or more specified process benchmarks, which involve detailed analysis of operating processes, can be conducted. Moreover, regional, national and trans-national comparisons can be applied (see TRUST, 2014; Berg, 2010; Cabrera Jr., 2008; Cabrera et al., 2011). Generally, benchmarks should be taken as a chance for further development instead of a burden.

Advice 3: An active role in shaping the benchmark projects instead of just participating in them helps to consider needs of each utility. Discussions on the selection and assessment of performance indicators can help to improve the next benchmarks as well as meaningfulness of the results.

Regarding customers' perspective on water services, two main challenges can be identified. First, users usually take the service and good quality of water for granted. Second, monopoly operation and prices typically arouse distrust in public. The TRUST report on 'Customer perspectives on new urban water services' (2012) has shown, that customers' awareness of the prevailing cost structure and service efforts are important factors influencing the customers' willingness to pay for the services. In achieving this goal, information and transparency are the main drivers for customers' acceptance. Moreover, transparency helps to prevent distrust and may contribute to justification of expenditures and prices.

Advice 4: The utilities' willingness to participate in benchmarks can be used as recognized external justification. Further, publication of (selected) results can provide transparency and thereby enhance public awareness of services as well as acceptance of prices.

Yardstick Competition

Yardstick competition or competition via comparison presents a certain merge between regulation and benchmarking, since yardstick competition is basically the use of benchmark results for regulatory decision making. For example, regulatory authorities can determine certain price caps on basis of the most efficient company identified within the sector benchmark (see TRUST, 2014): 26; Scheele, 2000). In this case the participation in the benchmarking project is mandatory, which makes advices 2 and 3 even more crucial for utilities.

Advice 5: If there are reasonable doubts on the comparability of the utilities due to their scale, scope or structural characteristics, these should be openly discussed. Certain evidence (e.g. on additional costs due to height differences) should be provided as basis for constructive criticism to find adequate solutions in dealing with these differences.

Retail Competition

Full retail competition is largely unknown in the water sector due to several sector-specific characteristics. However, the recent development in the Scottish water sector shows that a kind of limited retail competition can be applied and might significantly change the competitive environment. In Scotland a competitive retail market was implemented for public bodies and business customers. Whilst Scottish Water takes over the physical services for the whole country and still has a natural monopoly in the field of household customers, the non-domestic customers can choose between different licensed providers, which obtain corresponding services as wholesale from Scottish Water (see TRUST, 2014; TRUST, 2012a). The competition between licensed providers forces each provider to proactively understand customers' needs and define adequate service levels. Unique selling points and tailored "[...] service innovations such as interruptible service agreements, discounts for payment by direct debit and single billing for multiply supply points or sites" (Sawkins 2012: page 28) gain significant importance.

Advice 6: Retail competition makes the development of an adequate business model and certain differentiation strategies even more necessary. The consideration of customer needs as well as the implementation of tailored services and prices helps to positively distance from retail competitors (see also Chapter 2).

Conclusion

Different approaches to substitute direct competition are currently applied across Europe. The raising competitive environment is associated with new challenges such as need for

justification, certain regulatory constraints or even the need to positively apart from other utilities. Marketing and public image significantly gain relevance.

Therefore, communication with customers as well as regulatory authorities, the willingness to participate in projects and meetings to improve performance and a pro-active provision of information and transparency are very important. These measures usually help to improve the utilities reputation and to ensure that their needs are met.

1.2. Enhancing Efficiency

The main public driver for implementing competition enhancing approaches is to increase the efficiency of the utilities and thereby of the whole sector. This does not generally stand in contradiction with the objectives of utilities, since the efficiency improvement is also in their interest. In this context Balance and Taylor (2005) distinguish between three types of efficiency:

- "*Productive efficiency* is the extent to which firms minimise production costs given their current capital and fixed assets. [...]
- *Dynamic efficiency* refers to the extent to which the water industry invests in new capital that embodies new technology and consequently lower costs. [...]
- *Allocative efficiency* refers to whether consumers are purchasing the optimal quantity of the industry's product relative to its (economic and social) cost of production. Allocative efficiency will be maximised when the price of a product reflects its marginal production costs."

A significant number of studies deal with the efficiency measurement in the water sector, where both non-parametric and parametric methods like Data Envelopment Analysis (DEA) or Stochastic Frontier Analysis find application. Particularly, the influence of economies of scale, scope and density, the ownership structure (public vs. private) as well as the effects of regulation are considered by research as significant (see Abbott and Cohen, 2009; Romano and Guerrini, 2011, von Hirschausen et al., 2009; TRUST, 2014).

These research results are often heavily dependent on regional aspects. So for example, in some countries with very fragmented market structure economies of scale can be identified, whereas in countries with very concentrated businesses diseconomies of scale can be found (see von Hirschausen et al., 2009).

Advice 7: Water companies should make enhanced use of specific research results. Especially, regional investigations on productivity and efficiency in the water sector can help to identify potential for efficiency improvement. The sector-tailored studies can, for example, help the utility to decide about growth strategies (with regard to scale and/or scope) or can serve as a basis for debates on the future ownership design.

Beside this more structural perspective on efficiency, smaller measures can also help to improve utilities efficiency. For example, the optimization of internal processes can save resources, time or manpower and the use of new technologies can save energy and the associated power costs at production stage and even more for the water transfer and distribution.

Initiatives like process benchmarking of waterworks can help to achieve transparency about own costs as well as information on actual costs of other treatment processes, which can support future decision making. In best case operating procedures from other utilities can be adopted to achieve higher process efficiency (see Hein and Merkel, 2010).

Advice 8: Water utilities should make use of shared experiences: meetings, round tables, workshops, benchmarks and management circles help to learn from others and improve various types of efficiency (e.g. internal administrative processes or technical innovations).

Such projects are possible for varied processes and issues. It is worth finding out about ongoing regional or nationwide projects to see whether participation would thematically fit. But especially when nationwide projects seem exhausted, benefits can also be generated in trans-national projects (see Theuretzbacher et al., 2005; Dane and Schmitz, 2008) or by participating as a practice partner in research projects.

Advice 9: It may be useful to initiate an own project based on tailored utility-specific questions or problems and, if necessary, to consult an adviser.

2. BUSINESS MODELS AND INNOVATION

Since water and sewage services are ones of general interest (see European Parliament, Council, 2000) and, consequently, not typical for-profit businesses, their economic strategies often seem outdated to some extent.

Advice 10: The raising competitive environment in the water sector makes strategic concepts and business models even more important.

Therefore, this section shall provide both general findings on new business opportunities and sector-specific suggestions for using economic niches and innovations.

2.1. New Business Opportunities

Considering new business opportunities is closely linked to the question of the right business model. Hence, an appropriate definition of business model shall be found before its concrete design can be discussed.

Definition 'Business Model'

The term *business model* has significantly surged into the management vocabulary during the last decade (see Shafer et al. (2005): 200). However, "the concept of a business model has no established theoretical grounding in economics or in business studies" yet (Teece, 2010). A variety of definitions and interpretations can be found in the literature (see for an overview e.g. Rusnjak, 2014; Schallmo, 2013), which would not be discussed here in detail.

In the context of this report the definition of Morris et al. (2005) shall be adopted, since it reflects and integrates several literature streams. According to their research, "a business model is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets."

Raising the right Questions that underlie a Business Model

The first step to implement or reconfigure a suitable and successful business model is raising the right questions and finding utility-specific answers. Whereas the latter cannot be generalized and must be checked individually, the literature provides with instructions and advices on issues which have to be clarified. In a first step the current situation should be analysed, before desired future orientations could be discussed.

When choosing the right configurations different factors play a decisive role. Figure 2 shows the main factors that influence a business model as characterised by Morris et al. (2005).

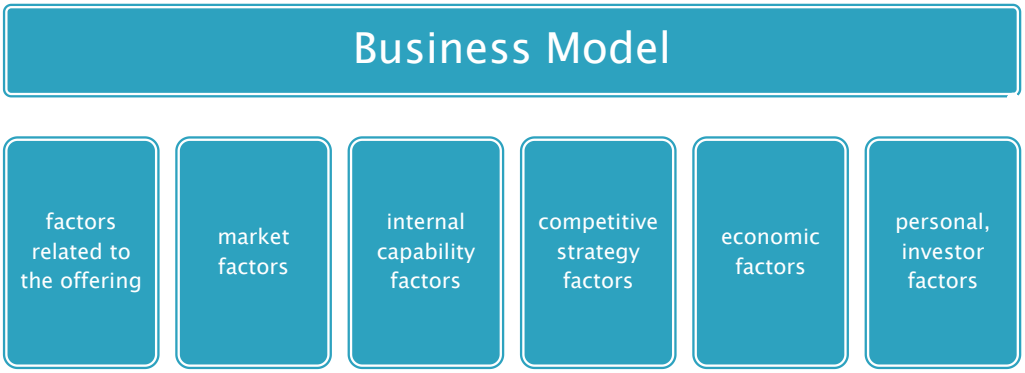

Figure 2: Main factors within a business model (see Morris et al. (2005): 730)

Moreover, these factors are associated with six questions that underlie a business model, which each company should be able to answer (Morris et al., 2005):

- *How do we create value?*
- *Who do we create value for?*
- *What is our source of competence?*
- *How do we competitively position ourselves?*
- *How do we make money?*
- *What are our time, scope, and size ambitions?*

Advice 11: A precise consideration and answer of these business model shaping questions (e.g. based on the instructions in Appendix A) is crucial for finding the right business model design and supports future strategic decision making.

Three Level Types of Business Models

The existence of various definitions of business model might explain different foci to be found in the literature. Morris et al. (2005) identified mainly three level types in the business model related literature: the *economic*, *operational* and *strategic* level. Their main decision variables can be summarized as follows (Morris et al., 2005):

- *Economic level*:
  Revenue sources, pricing methodologies, cost structures, margins, and expected volumes
- *Operational level*:
  Production or service delivery methods, administrative processes, resource flows, knowledge management and logistical streams
- *Strategic level*:
  Overall directions in the firm's market positioning, interactions across organizational boundaries and growth opportunities

These decision variables help to make the not entirely clear deferrable topic of business models more manageable and shall therefore be the basis of the water sector related findings in the next section.

Advice 12: Most general strategic economic approaches cannot be transferred one to one to the water sector due to its sector-specific characteristics. However, it is worth to consider general findings, scrutinize certain limitations or adopt suitable parts of these broad approaches.

2.2. Business Opportunities and/or Innovations within the Water Sector

The core business of water and wastewater services seems to be clearly defined. Particularly, the main aspects of service quality such as drinking water quality and standards for wastewater treatment generally underlie very high requirements. However, there are certain "[...] aspects of service quality, such as water pressure, service interruptions (planned and unplanned), service availability, billing accuracy and customer response times, which tend to be less regulated" (Balance/Taylor (2005): 24). Within an increasing competitive environment these aspects demand more attention.

Beside these traditional service quality related aspects, there are several other opportunities for water and/or wastewater utilities to set themselves positively apart, to increase efficiency as well as reputation and to ensure successful future business operation. Both measures within core business and enhancement of non-core business activities help to strengthen the water utilities market position. In the following business opportunities and innovations shall be briefly presented to give impulses and show potential for reorientation.

Economic level

Within the economic level costs, prices and revenues are in focus. They significantly influence the financial stability of a water utility.

Revenue sources

The main revenue source is the sale of water respectively the removal of wastewater, so the revenues from core business. The traditional customer is the end-user of these services. However, there are also other potential customers such as other utilities, private firms or organizations, if the right offers can be provided.

- The offering of tailored services and consulting to other utilities provides great national and international potential. A wide range of services is conceivable. For example, services such as leakage detection and repair, monitoring, maintenance or laboratory services (see e.g. BWV, 2014). But also consulting services on successful processes and concepts, such as innovative tariff models, which have been developed by a utility for internal

use and could be offered to other utilities or companies, can generate additional income.

- The remodelling of old plants and other facilities for rental can be very interesting for many utilities. The utilities often own very unique old buildings like water plants and towers, which had been taken out of operation. Nowadays, they could be successfully used as museum, place for exhibitions or other activities. Depending on the size of the facility, a use as an event location or for conferences, workshops and weddings is also conceivable (see e.g. RWW, 2014). Moreover, such offerings generally raise positive public attention.
- Another pillar of revenue could be the sale of self-developed technologies. Especially a sale of water technologies and innovations beyond national borders could be lucrative and should therefore be considered. Harbach et al. (2011) particularly expect an increasing demand for irrigation systems, technical equipment such as pumps and armatures, filtration technologies and disinfection procedures as well as efficient sanitary facilities. Consequently, high international sales potential is expected.

Pricing methodologies

The prices for water services have significant influence on the actual revenues and, thereby, on the degree of cost recovery. Whilst the EU Water Framework Directive demands full cost recovery "by including environmental and resource costs, [...] no detailed explanations were implemented in how to do so" (Klawitter (2006). Due to several regional circumstances, such as natural conditions and the type of equipment, the specific costs can vary. Consequently, there is no one fits all price, which could be implemented Europe-wide, so prices differ from area to area (see European Commission (2002).

This gives a room for the application of different types of tariff models (see for an overview Tsagarakis (2005): 5). Generally, it is useful to check both traditional and new/modern pricing methodologies on their suitability. For example, in countries with seasonal droughts the application of seasonal pricing can be an adequate solution (see e.g. Griffin (2006), whereas in regions with decreasing population and/or declining water consumption a change of the tariff structure in favour of a higher fixed component could be a solution to avoid a decline in revenue (see Meij et al., 2005; Reif, 2002).

Cost structures

The cost structure of the core business in the sector is characterized by extremely high fixed costs of around 80 % and consequently a relatively small proportion of variable costs (see Meij et al., 2005); Reif, 2002). This basic cost structure is only partially influenceable, which typically makes general cost reductions more important in the water industry than actual changes of the cost structure.

Margins

Regarding the utilities margins specific national regulatory requirements have to be considered. In principle, revenues from water sales (core business) should cover costs without exploiting the monopoly status. However, margins could be normally generated through the non-core business.

Expected volumes

Water demand forecasts are essential in the water sector since they allow estimating the revenues from core business. The personal water demand is dependent on several factors such as e.g. household size, water price, age, income, self-sufficiency and the number of rain days (see Hillenbrand and Schleich, 2009); Worthington and Hoffmann, 2008). Main challenge is the fact that expected volumes are only partially influenceable. Especially changes caused by demographic change are basically unavoidable. However, other can be influenced within a demand management and with respect to price elasticity. In this context water saving advices, sociological methods as well as economic methods have to be emphasized (see Stephenson, 2005). The use of adequate water demand models as well as an associated demand management helps to meet future challenges.

Advice 13: The economic factors such as revenue sources and pricing methodologies within a utilities business model should be critically questioned and evaluated. New business opportunities mainly arise in the non-core business, where much potential can often easily be skimmed off.

Operational level

Amongst others service delivery methods, knowledge management and administrative processes characterize the operational level. The following section briefly reviews different design options for the water sector.

Production or service delivery methods

The core business in the water supply is largely determined. However, certain fields of action can be identified within production or service delivery methods.

- The implementation and use of new water technologies such as advanced filtration methods, leakage detection methods or more accurate water meter often help to increase efficiency within production or service delivery. Costs and benefits of these new water technologies must be carefully weighted to decide whether they are useful within a special utility or not.
- Many utilities still have some room for product differentiation such as specific dealing with grey water. "Grey water is defined as urban wastewater without any inputs from toilets and so generally includes sources from

baths, showers, hand basins, washing machines, dishwashers and kitchen sinks" (Jefferson et al., 2004). The reuse of grey water offers a great opportunity within water demand management, since fresh water sources can be saved (see Al-Jayyousi, 2003). Jefferson et al. (2004) summarize possible reuses of grey water presented in the literature, such as irrigation of lawns at cemeteries, golf courses and college campuses, vehicle washing, fire protection, boiler feed water, preservation of wetlands and toilet respectively urinal flushing. Regarding the latter positive experiences from Berlin show that "[...] the total water for toilet flushing (about 15 to 55 l/person/day) can be substituted with service water without hygienic risk or comfort loss" (Nolde, 2000). Different technological approaches can be found to support grey water reuse (see Li et al., 2009) and have to be studied whether they are suitable for the utilities' demands.

- Outsourcing of parts of the production process or certain services can be an alternative to own performance. For example, it is conceivable that the organisation of water meter reading is done through a special service company, such as ServCount in Hamburg (see ServCount, 2014).
- Especially in times of raising competition the extension of customer services is extremely relevant. One possibility to find out, which services are really desired from customer's point of view, is to enhance the public participation. For example, a special customer advisory board shall be engaged to discuss questions around water with the local water supplier in Berlin (see BWB, 2014). Other methods to enhance public participation in the water sector such as a referendum, public hearings, opinion surveys, negotiated rulemaking, web panels, citizens' jury, focus groups and social learning groups are also conceivable. The main goals are to raise awareness, support better decision making, an increased legitimacy, accountability and a form of collective learning (see Huitema et al., 2009). Enhanced customer involvement can also be achieved via new social media. It could be beneficial to create tailored apps for providing information from water utility side (e.g. live updates on supply interruptions) or from customer side (e.g. a water meter reading app that allows people to send pictures of their water meter with their usage data). Moreover, an intensified communication in social networks like Facebook or Twitter can also be very interesting for the water sector to easily communicate with customers (see e.g. Scottish Water, 2014).

Administrative processes

The administrative processes within a utility often offer room for optimization.

- Automated business processes via electronic business (e-Business) and enhanced use of e-Billing methods can save resources such as time, money and paper/postage within external administrative processes. "E-Business is

not exclusive for large enterprises [...] and opens opportunities to foster competitiveness" (Cruz-Cunha and Varajão, 2011).

- However, internal (administrative) processes also often need optimization. Especially, in large utilities the use of the shared service concept could help to generate positive outcomes from economies of scale. "Shared service is a collaborative strategy in which a subset of business functions are concentrated into a new, semi-autonomous business unit [...] to promote efficiency, value generation, cost savings, and improved services [...]" (Bergeron, 2003).
- For small utilities sharing of administrative services with external partners could be useful, such as a collective billing for several (not necessary close located) utilities within an inter-municipal cooperation (see e.g. TRUST, 2014).
- Some administrative services such as billing can be shared with companies from other sectors, which are serving the same area and users (e.g. energy or telephone industry) or among different services of the same company (e.g. drinking water, wastewater and electricity). Companies can also move to a *convergent charging* system as it is happening for other services to improve efficiency (see e.g. UrbanWater, 2012).

Resource flows

The determination of suitable financing strategies and sources is very important. Certain resource flow assessments can help to optimize financing strategies (see e.g. WSP, 2004; WSP, 2004b). Ideally, a utility should find an adequate balance between debt and equity. The calculation of the Weighted Average Cost of Capital (WACC) can support this decision. Generally, the most efficient financial structure appears as a mix of debt and equity with the lowest WACC (see Frontier, 2013).

Knowledge management

The documentation and use of knowledge plays an important role within the utilities development. Different systems like data warehouse systems and other specific software support individual knowledge management.

- Currently, the adoption of smart grid technologies for water services is discussed. These systems offer advantages for both customers and utilities. The smart grid for water includes components such as advanced meter reading infrastructure, customer information systems for billing and account management, equipment control, work order generation and control, geographic information systems and analytic engines. The smart grid for water presents thereby an important data analysis platform for a water utility (see Hill/Symmons, 2013). Moreover, smart grids "allow

customers to understand their actual consumption in real time [...] [and] to actively control [...]" it (Hill/Symmons, 2013).

- Moreover, certain synergies can be used within the data collection, such as sending water and energy consumption data via the same hardware infrastructure (see e.g. UrbanWater, 2012).
- A more holistic perspective on knowledge and competences leads to the question of balance between knowledge keeping vs. outsourcing. The utilities must be aware that the decision for outsourcing of certain activities may save resources, but comes typically along with the lost of specific know how. This phenomenon can also occur when workers go into retirement (see e.g. Hill and Symmons, 2013). Especially technical divisions could benefit from specific training projects and internal workshops in addition to the implementation of modern data analysis systems. These measures could help to avoid that knowledge and competences leave the utility with the older employees.

Logistical streams

Last but not least, logistical processes and streams offer potential for optimization within the operational level of a water utility. Measures such as e.g. changing the supplier of chloride or of energy or optimization of routes within the utility can improve the logistical performance and should therefore be revisited at regular intervals.

Advice 14: Due to changing conditions and requirements in the sector, the testing of new or modified services makes sense on economic as well as on operational level. In particular, the implementation of smart grids for water and the enhancement of public participation to analyse desired customer services help to meet the requirements of the 21st Century.

Strategic level

Within the strategic level, among others, utilities' market position and future direction of development are defined. Thereby the strategic level significantly influences economic and operational decision making.

Overall directions in the firm's market positioning

The overall strategic targets can differ within the water sector, e.g. growth vs. stability. They have to be clearly defined and communicated within the utility to get the employees involved on an early stage. Consequently, strategic decisions should be geared to these objectives.

Interactions across organizational boundaries

The interaction across organisational boundaries such as via participation in regional, national or international projects to widen the utilities perspective, helps to better assess own position and performance. Identifying individual strengths and weaknesses in a wider context offer an adequate starting point for future strategic orientation.

Growth opportunities

If growth opportunities come into utility's focus, different growth strategies are generally applicable. Ansoff (1958) defines four significant growth strategies, which are still meaningful: market penetration, market development, product development and diversification. Market penetration reflects increased sales of existing products in the current market, either via increased volume or finding new customers. Market development describes the strategy of offering present or only slightly modified products in new markets, so the expansions of markets. The product development strategy describes the focus on new or modified products but within the present market. The fourth growth strategy diversification "[...] calls for a simultaneous departure from the present product line and the present market structure [...]" (Ansoff, 1958).

Figure 3: Growth Strategies (see Ansoff, 1958)

Transferring the considerations of Ansoff (1958) to the current situation in most water markets, especially the growth strategies *market development*, *product development* and *diversification* are relevant. A growth strategy within the water sector mostly does not reflect a volume increase in the existing regional market due to limited demand or limited resources, but rather an expansion of the coverage area (new market, old product), the development of non-core businesses (new products, old market) or both (new products, new market).

- *Market development* can be achieved through several organizational models. Basically, the extension of the concession area or even international participation can be achieved via different forms of public-public- or private-public- partnerships. Typical models of private-public-partnerships are full privatisation, concessions, leasing contracts, management contracts and service contracts (see for an overview Stephenson, 2005). According to Mandri-Perrott and Stiggers (2013) the primary aim of private-public-partnerships "[...] is to fund, construct, renovate, manage and/or, maintain a given piece of infrastructure or providing a service." The participation in other markets via adequate organizational models may help to generate the positive effects of economies of scale and size. However, the actual effects have to be proved individually (see also Advice 7).
- Chances of *product development* have already been discussed within the economic and operational level. Moreover, the integration of water and wastewater services can help to generate economies of scope, since synergies often take place within e.g. administrative processes, pumping technologies or access to infrastructure (see Worthington, 2011). Basically, economies of scope exist when "[...] a single utility can produce different products at lower cost than several specialised utilities [...]" (Worthington, 2011). Beside the aforementioned integration of water and sewage services, economies of scope can potentially be achieved via "[...] the provision of water outputs of varying characteristics to different customers, say, households and non-households (industrial and commercial users) [...] [and] from conventionally unrelated network utility services provided to households and other users", such as e.g. gas and electricity (Worthington, 2011). However, the actual potential has to be controlled individually (see Advice 7).
- An impressive example for *diversification* is the case of Veolia, which started as Compagnie Génerale des Eaux supplying water to Lyon and is now an international successful company providing among others services from water management over energy services and waste management to transportation (see Normann and Ramirez, 1993; Veolia, 2014a; Veolia, 2014b). Even if this development is not desirable for all providers to this high extent, parts of the strategies and ideas can still be used as impulses for the own business model design.
- The positive effects of economies of scale and scope are main drivers for growth. Moreover, globalisation, margin pressure, best perspectives for employees, demand for value enhancement and ensuring independence are growth driver (Krys (2011) and justify a detailed examination of the potential measures.

Advice 15: The utility's overall strategy significantly influences the activities on economic and operational level. In particular growth strategies like market development, product development and diversification can be also applied in the often still traditional and local orientated water sector.

The economic, operational and strategic level of a utilities business model are not clearly separable. In some areas there are overlaps. However, the structuring provides a good opportunity to break this very broad, holistic approach usefully down. In summary, new business opportunities for water utilities have to be identified and carefully analysed (e.g. cost-benefit analysis) before implementation and control.

3. CONCLUSIONS

Basically, the competition and efficiency pressure increases in the water sector, which makes proactive solutions and the use of business niches even more relevant for water management practitioners. The briefly presented business opportunities shall give decision makers impulses for future development. General findings together with sector specific examples help to give a more practical access to the abstract concept of business modelling. Moreover, references provide the opportunity to go deeper into utility-relevant topics.

In the following the main advices shall be presented again to summarize the core results. However, they should not be seen isolated from the rest of this report.

Advice 1: New concessions offer the opportunity for growth and thereby the use of economies of scale and size.

Advice 2: The dialog between regulator and regulated companies is extremely important. Only within a close exchange system weaknesses can be uncovered and solved.

Advice 3: An active role in shaping the benchmark projects instead of just participating in them helps to consider needs of each utility. Discussions on the selection and assessment of performance indicators can help to improve the next benchmarks as well as meaningfulness of the results.

Advice 4: The utilities' willingness to participate in benchmarks can be used as recognized external justification. Further, publication of (selected) results can provide transparency and thereby enhance public awareness of services as well as acceptance of prices.

Advice 5: If there are reasonable doubts on the comparability of the utilities due to their scale, scope or structural characteristics, these should be openly discussed. Certain evidence (e.g. on additional costs due to height differences) should be provided as basis for constructive criticism to find adequate solutions in dealing with these differences.

Advice 6: Retail competition makes the development of an adequate business model and certain differentiation strategies even more necessary. The consideration of customer needs as well as the implementation of tailored services and prices helps to positively distance from retail competitors.

Advice 7: Water companies should make enhanced use of specific research results. Especially, regional investigations on productivity and efficiency in the water sector can help to identify potential for efficiency improvement. The sector-tailored studies can, for example, help the utility to decide about growth strategies (with regard to scale and/or scope) or can serve as a basis for debates on the future ownership design.

Advice 8: Water utilities should make use of shared experiences: meetings, round tables, workshops, benchmarks and management circles help to learn from others and improve various types of efficiency (e.g. internal administrative processes or technical innovations).

Advice 9: It may be useful to initiate an own project based on tailored utility-specific questions or problems and, if necessary, to consult an adviser.

Advice 10: The raising competitive environment in the water sector makes strategic concepts and business models even more important.

Advice 11: A precise consideration and answer of certain business model shaping questions (e.g. based on the instructions in Appendix A) is crucial for finding the right business model design and supports future strategic decision making.

Advice 12: Most general strategic economic approaches cannot be transferred one to one to the water sector due to its sector-specific characteristics. However, it is worth to consider general findings, scrutinize certain limitations or adopt suitable parts of these broad approaches.

Advice 13: The economic factors such as revenue sources and pricing methodologies within a utilities business model should be critically questioned and evaluated. New business opportunities mainly arise in the non-core business, where much potential can often easily be skimmed off.

Advice 14: Due to changing conditions and requirements in the sector, the testing of new or modified services makes sense on economic as well as on operational level. In particular, the implementation of smart grids for water and the enhancement of public participation to analyse desired customer services help to meet the requirements of the 21st Century.

Advice 15: The utility's overall strategy significantly influences the activities on economic and operational level. In particular growth strategies like market development, product development and diversification can be also applied in the often still traditional and local orientated water sector.

APPENDIX A

Six questions that underlie a business model

Component 1 (factors related to the offering): How do we create value? (select from each set)

- offering: primarily products/primarily services/heavy mix
- offering: standardized/some customization/high customization
- offering: broad line/medium breadth/narrow line
- offering: deep lines/medium depth/shallow lines
- offering: access to product/ product itself/ product bundled with other firm's product
- offering: internal manufacturing or service delivery/ outsourcing/ licensing/ reselling/ value added reselling
- offering: direct distribution/indirect distribution (if indirect: single or multichannel)

Component 2 (market factors): Who do we create value for? (select from each set)

- type of organization: b-to-b/b-to-c/ both
- local/regional/national/international
- where customer is in value chain: upstream supplier/ downstream supplier/ government/ institutional/ wholesaler/ retailer/ service provider/ final consumer
- broad or general market/multiple segment/niche market
- transactional/relational

Component 3 (internal capability factors): What is our source of competence? (select one or more)

- production/operating systems
- selling/marketing
- information management/mining/packaging
- technology/R&D/creative or innovative capability/intellectual
- financial transactions/arbitrage
- supply chain management
- networking/resource leveraging

Component 4 (competitive strategy factors): How do we competitively position ourselves? (select one or more)

- image of operational excellence/consistency/dependability/speed
- product or service quality/selection/features/availability
- innovation leadership
- low cost/efficiency
- intimate customer relationship/experience

Component 5 (economic factors): How we make money? (select from each set)

- pricing and revenue sources: fixed/mixed/flexible
- operating leverage: high/medium/low
- volumes: high/medium/low
- margins: high/medium/low

Component 6 (personal/investor factors): What are our time, scope, and size ambitions? (select one)

- subsistence model
- income model
- growth model
- speculative model

Figure 4:
Six questions that underlie a business model (Morris et al. (2005): 730)

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