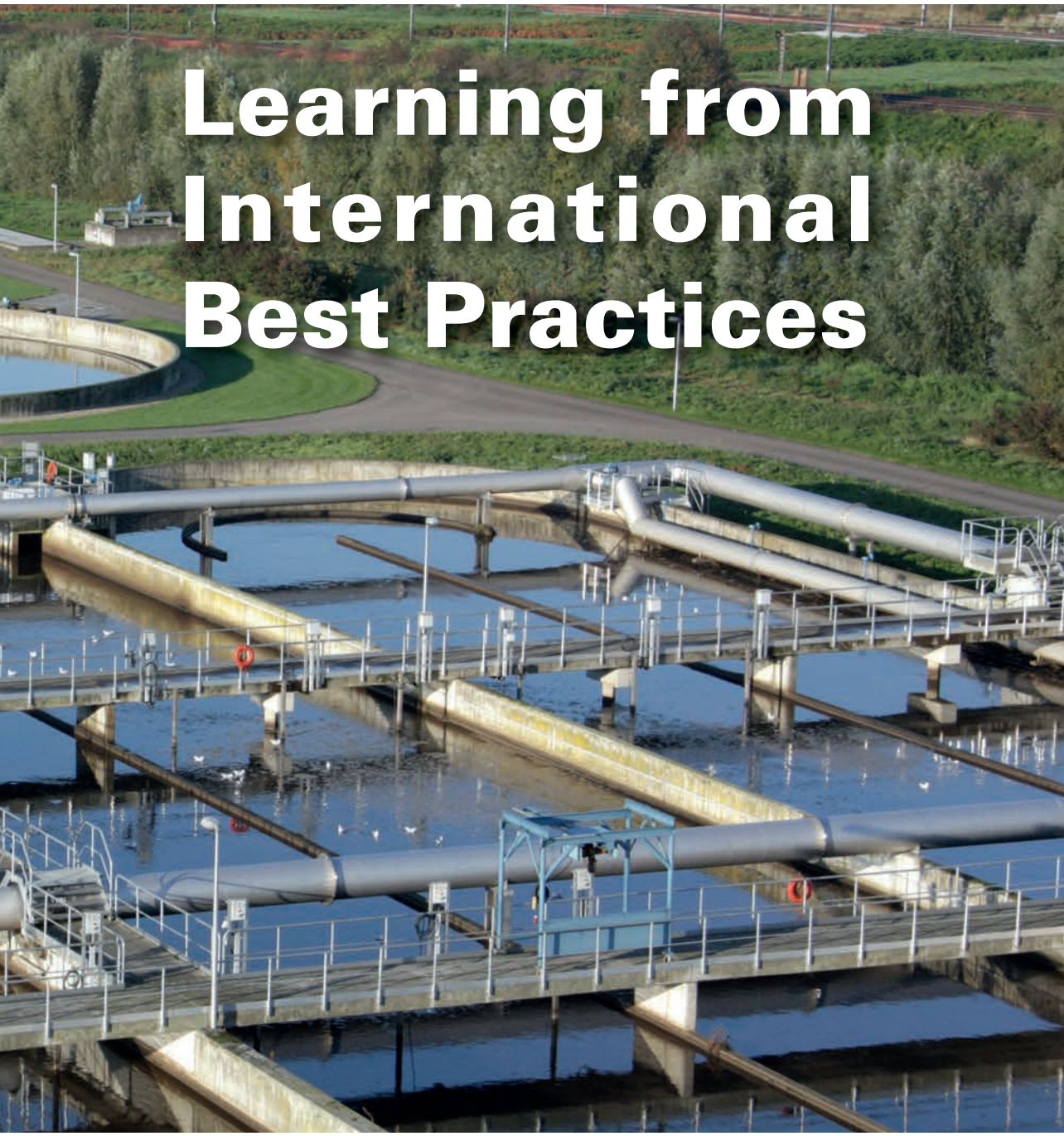
European
Benchmarking
Co-operation



# Learning from International Best Practices

2014 WATER & WASTEWATER BENCHMARK

# Participants 2014 exercise

**Belgium**
- Aquafin NV
- Brussels Drinking Water
- Brussels Wastewater
- De Watergroep
- Intercommunale des Eaux du Centre du Brabant Wallon
- Société Publique de Gestion de l'Eau
- Société Wallonne des Eaux
- VIVAQUA

**Denmark**
- VCS Denmark

**France**
- Service public de l'eau Eau de Paris
- Syndicat des Eaux d'Ile de France

**Germany**
- Hamburg Wasser
- hanseWasser Bremen GmbH

**Italy**
- CAP Holding S.p.A.
- Mediterranea delle Acque S.p.A.
- SMA Torino S.p.A.

**Japan**
- Sewerage Utility, City of Yokohama

**Kenya**
- Embu Water and Sanitation Company Ltd.
- Nairobi City Water and Sewerage Company
- Nyeri Water and Sewerage Company Ltd.
- Thika Water and Sewerage Company Ltd.

**Norway**
- Oslo kommune Vann- og Avløpsetaten

**Poland**
- Aquanet Spólka Akcyjna
- Municipal Water and Sewage Company SA Wroclaw

**Russia**
- Joint Stock Company Mosvodokanal
- State Enterprise "Vodokanal of Saint-Petersburg"

**Singapore**
- Public Utility Board

**Spain**
- Aquajerez, S.L
- Canal de Isabel II Gestión S.A.
- Consorcio de Aguas de Bilbao Bizkaia
- Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla S.A.

**Sweden**
- Sydvatten A.B.

**Switzerland**
- SIG - Environnment - Wastewater utility

**The Netherlands**
- Brabant Water N.V.
- Evides Waterbedrijf N.V.
- Hoogheemraadschap Amstel, Gooi en Vecht
- N.V. Dunea
- N.V. PWN Waterleidingbedrijf Noord-Holland
- N.V. Waterbedrijf Groningen
- N.V. Waterleiding Maatschappij Limburg
- N.V. Waterleidingmaatschappij Drenthe
- Oasen N.V.
- Stichting Waternet
- Vitens N.V.

**United Kingdom**
- Dwr Cymru Welsh Water
- Northumbrian Water Limited
- Yorkshire Water

**United States**
- Charleston Water System

Cover photo: Aquafin NV, Antwerp

European
Benchmarking
Co-operation

# Learning from International Best Practices

2014 WATER & WASTEWATER BENCHMARK

# Table of contents


**Foreword** 4

**Introduction** 6

**Drinking water** 8

**Wastewater** 16

**Good practices snapshots** 24

- HAMBURG WASSER - Plus Energy Wastewater Treatment Plant 26

**Participants' experiences** 30

- EMASESA - Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla S.A. (Spain) 32
- IECBW - Intercommunale des Eaux du Centre du Brabant Wallon 33
- PUB - Public Utilities Board, Singapore 34

**Endnotes** 35

**Colophon** 36

# Foreword

**Carl-Emil Larsen**
**CEO Danish Water and Wastewater Association (DANVA)**
**Chairman of the Board of EBC Foundation**

## EBC Foundation

The year 2014 has been a milestone for the EBC-consortium in many ways. To start, the founding partners DANVA, FIWA, Norsk Vann and Vewin decided to convert the consortium into a separate legal entity to better focus on the core business, create a stronger European profile and increase possibilities for external project funding. July 2014, the project consortium was converted into EBC Foundation, a foundation under Dutch law with the mission to facilitate benchmarking for improving water services in Europe and beyond.
The EBC Foundation is governed by a Board, composed of representatives of three of the founding partners (DANVA, Norsk Vann and Vewin), the Danube Water Programme and the European Federation of national associations of water- and wastewater service providers EurEau. In the new structure, EBC can operate more independently, while still closely linked to the water utility sector to secure the focus on its mission to support utilities in improving water services through benchmarking and learning from each other.

## Western Europe

In 2014, the annual benchmarking exercise in Western Europe IB2013 attracted 48 utilities from 17 countries. At the end of the exercise in November, a record number of 115 delegates attended the benchmarking workshop in Antwerp, Belgium, which was co-organised by host company Aquafin. Results from the performance assessment were discussed and best practices were exchanged.
Especially for utilities that already participated for several years in the programme, EBC organised a session to discuss future activities to support performance improvement. Based on the suggestions from these session future workshops will, next to discussing assessment results, be dedicated to the second step in the benchmarking process, the definition and implementation of improvement actions.





## Danube Water Programme

July 2014 EBC concluded a contract with the World Bank/IAWD-led Danube Water Programme, to develop separate national/regional benchmarking programmes in the Danube region. The contract lasts until October 2015, with the intention to extend the activities for three more years. As a result, in 2014 three benchmarking ‘hubs’ have been established in Bulgaria, in Kosovo/Albania and in the Ex-Yu region in close collaboration with the local national water associations. A fourth hub in Ukraine will start spring 2015.
Starting point for the national/regional programmes in the Danube region is that the lead and final responsibility stays with the national water associations; EBC Foundation acts as a benchmarking knowledge- and service centre and supports the hubs by training local benchmarking staff, by providing methodologies, necessary documents and ICT-tools and by connecting utility networks to exchange best practices. So far, 36 utilities from the Danube region have been involved in a first benchmarking cycle supported by EBC.

## Kenya

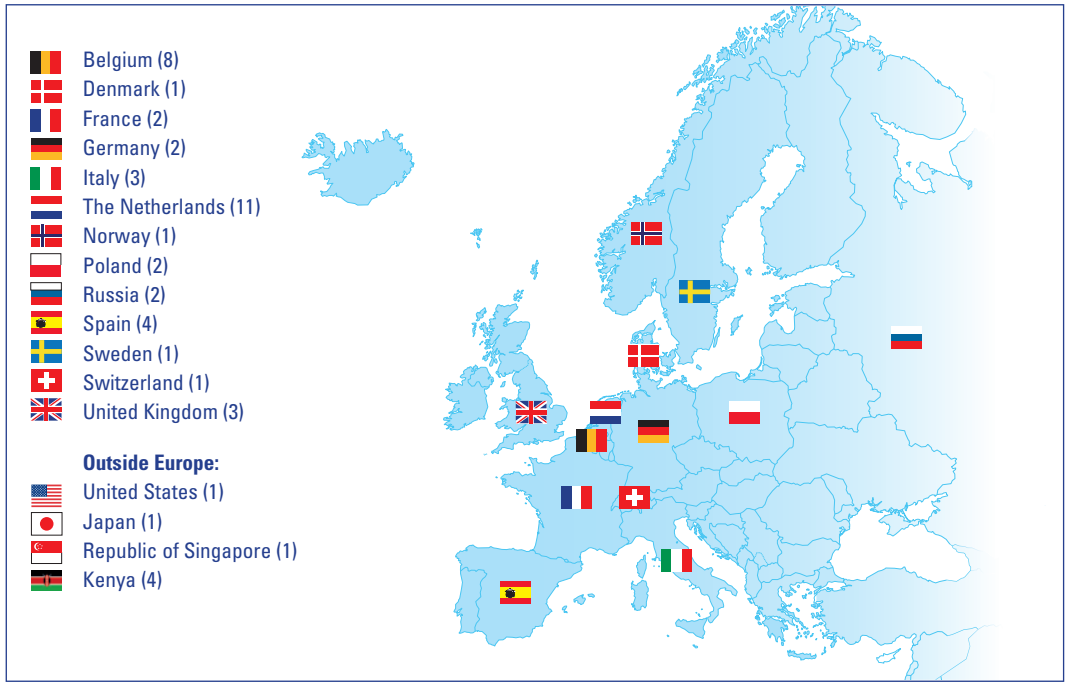
Since 2012 an EU-funded benchmarking project is carried out in Kenya by a consortium led by Vitens-Evides International from The Netherlands. In this project, EBC supports the Kenyan national water association WASPA in developing a benchmarking programme. As spin-off of this project, in 2014 four Kenyan water utilities participated in the Western European benchmarking exercise IB2013 to experience what it is like. In order to get a complete picture of water benchmarking in Europe, a Kenyan delegation attended EBC’s benchmarking workshop in Antwerp. In 2015 WASPA and its utility members will decide on continuing the collaboration with EBC, if possible via a Kenyan benchmarking hub.

## EIP Water Action group

April 2014, EBC Foundation was recognised by the European Commission as a so-called EIP Water Action Group. The “European Innovation Partnership” aims to boost the economy in the EU through innovation and Action Groups are a way to connect partners in the innovation chain.The EBC Action Group has attracted several partners from Europe and can be considered as a “think tank” for the EBC-programme, in particular on the future development of benchmarking. After several successful benchmarking exercises, the programme focus should move from the performance assessment part to the more challenging part of how to translate assessment results into improvement actions. From this perspective, the Action Group is now working on a roadmap to better support utilities in their never ending improvement efforts.

# Introduction

Since 2007, the European Benchmarking Co-operation (EBC) operates an international benchmarking programme for mainly Western European water- & wastewater utilities, with the objective to improve their services. In 2014 EBC organised its eighth international benchmarking exercise welcoming 48 participants from 17 different countries. Seven of these utilities are from countries outside Europe (Japan, Singapore, United States and Kenya). The 2014 exercise is based on data from 2013. The project was coordinated by Vewin (Association of Dutch Water Companies) and supported by Accenture.




The benchmarking process started early 2014 with an invitation to European water utilities to join EBC's benchmarking exercise. On the 14th of May, 10 delegates from different water utilities attended the Orientation- & Training workshop, traditionally organised at the office of host company HOFOR in Copenhagen. Eventually, 48 utilities decided to participate; data collection started in June, using the dedicated EBC internet portal. After the initial collection phase, data were subjected to three rounds of analysis and correction, resulting in a validated data set used for the final company reports and this public report.

To make the benchmarking programme accessible to all type of water utilities, EBC offers three levels of participation (basic, standard and advanced). These different levels make the programme interesting for water utilities that are used to advanced data collection, as well as for companies that have just started with basic data collection. During the data collection process, participants are supported by EBC through an expert helpdesk assuring a high quality of the data.
Like in every year, in the 2014 benchmarking exercise improvements have been made in the set of questions and in the reporting. The Climate Footprint analysis has been further developed and several questions have been added to enable future comparison with IBNet, the global largest database of performance information from the World Bank.

On the 18th and 19th of November, 115 representatives of the participating utilities gathered for the annual benchmarking workshop in Antwerp, Belgium, which was co-organised with host company Aquafin. This two days event provided participants with a platform where they could exchange practices and ideas for improvements. Twenty-two sessions in total were dedicated to the numerical results of the benchmarking exercise (performance assessment) and to best practices (performance improvement). Next to this, Aquafin organised a very insightful visit to its research- and development facilities and to one of its wastewater treatment plants.

After the workshop, participants could make the last corrections in the database and final reports were distributed end of December.

**The delegates of the 2014 benchmarking workshop in Antwerp**

# DRINKING WATER

# Drinking water

**This section contains an overview of this year's performance assessment on drinking water services. Data of other services that the participating companies may have provided (i.e. wastewater or gas distribution) are excluded from the analysis. In EBC's benchmarking programme, the indicators are divided into five performance areas: water quality, reliability, service quality, sustainability and finance & efficiency. Additionally, specific attention is paid to indicators relevant to asset management. The current public report only shows a subset of the available performance indicators for the drinking water service to illustrate key findings. In the ideal situation the group of participants that compares performance would be the same over time. The group of utilities that participated in the 2014 exercise however differs from the one in 2013. Hence, the current group level results cannot be compared with those of last year. In the individual company reports, participants can however track changes both in their own and in their peers' performance.**

## Water quality test compliance is high

Water quality is generally seen as the most important aspect of the drinking water service. Consumers need safe and clean water as a basic commodity. To assess the water quality of the participating utilities, EBC measures the percentage of quality tests in compliance with national regulatory standards. Since the standards for water quality differ between countries, test compliance does not allow for an absolute comparison. However, the variation between standards is limited, since the majority of the participating utilities originate from Europe, where the national standards are based on the European Drinking Water Directive.
Water quality compliance is very high across the EBC group. Most companies score close to 100%. It is worth mentioning that a non-compliant test does not necessarily mean an imminent health risk for the consumer. It can for example be a non-hazardous flaw (i.e. an abnormal colour). Furthermore, many regulatory standards contain a safety margin, so that a case of non-compliance does not necessarily mean public health is at risk.

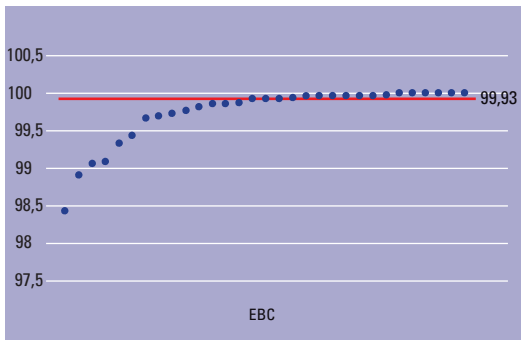



**Figure 1: Quality of supplied water (%)**

*Each data point represents the score of a participating utility. The horizontal line shows the median value. According to the programme's Code of Conduct performance comparisons in this public report do not show participants' names. Note that the number of data points varies per figure, because not all participating utilities have submitted a full dataset.*





## Reliability is reasonable

Reliability also is an essential performance indicator for a water utility. The customers expect a continuous supply of safe and clear water. EBC uses mains failures as an indicator of reliability. Mains failures are breaks and leakages of mains pipes, valves and fittings leading to interruption or low-pressure supply. Results of reliability vary widely within the EBC group. A large group of participants is clustered around the median value of 14 failures per 100 km of mains, per year. Factors that may influence the mains failure rate include the network condition, soil condition, traffic load and water pressure.

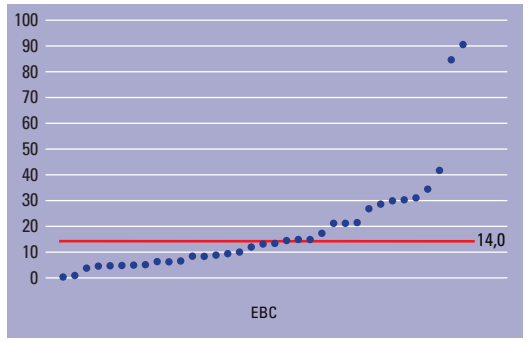


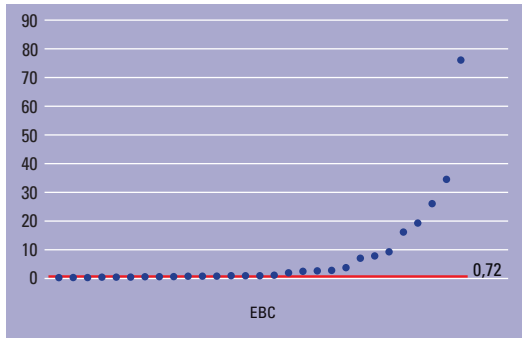

**Figure 2: Mains failures (No./100 km)**

In addition to mains failures the programme also looks at distribution losses and (at the advanced level) at customer minutes lost. Since failures may also occur without the customer noticing, adding extra indicators like distribution losses and customer minutes lost allows for a more balanced view of reliability performance.
It is also worth mentioning that an improvement in monitoring failures may (at first) cause an increase in mains failures, as not in all cases failures are properly registered.

## Service Quality is good, with quite some room for improvement for some

If the service of a water utility is not up to the required standard of the customer, the customer can file a complaint. Hence the number of complaints filed by utilities' customers is an adequate measure for service quality. Figure 3 displays the complaints that are related to the actual supply of drinking water, including water pressure, (medium to long term) continuity, water quality and (short term) interruptions. Complaints on billing are measured but not taken into account in this indicator. The majority of the EBC group scores very well with a median of 0,72 complaints per 1000 properties.

**Figure 3: Service complaints per connected property (complaints/1000 properties)**




The emergence of social media also created a new channel of communication between consumers and utilities. Many water utilities are increasingly using social media to better inform their customers. Hence, through these new channels, mutual understanding is facilitated and formal complaints may be prevented.

## Sustainability

Sustainability is a key point of the agenda of many water utilities. It can be approached and measured in various ways. The EBC programme uses the widely recognised Triple Bottom Line approach, which investigates social, environmental and economic sustainability.

### Social sustainability: households spend around 0,58% of disposable income on drinking water services

Water is a basic necessity, and customers usually do not have viable alternatives to their local water supplier. This unilateral reliance leaves it to the utility to make sure its product is affordable. Hence, EBC measures social sustainability of the drinking water services by showing the water bill as a share of the disposable household income. In the current EBC group this ranges from 0,26% to 1,10%, with a median of 0,58%.

### Environmental sustainability: large variations in electricity use

The EBC programme measures environmental sustainability through several indicators, which include electricity use for water production, energy recovery, inefficiency of use of water resources, the reuse of treatment residuals and climate footprint. Figure 5 shows the electricity used by pumps in the abstraction, treatment and distribution of water, per $m^3$ that is produced. The use of electricity is influenced by the type of water resources, geography and treatment processes. Pumps are the most voracious consumers of electricity, which makes their efficiency an important factor in the reduction of electricity use. This benchmarking exercise resulted in a median electricity usage for pumping of 0,47 kWh per $m^3$ water produced.

**Figure 4: Share of water bill in disposable household income (%)**

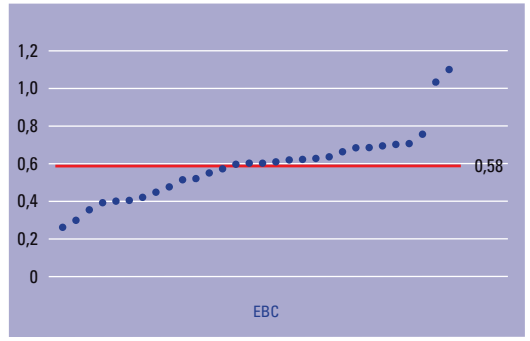
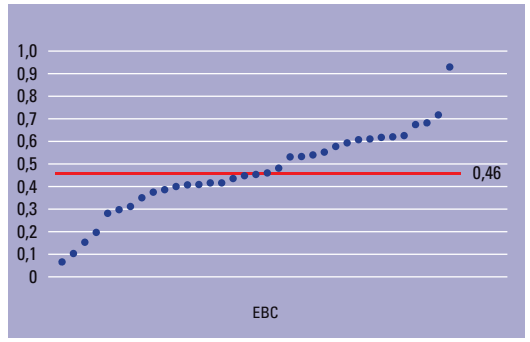



**Figure 5: Electricity use per $m^3$ water produced ($kWh/m^3$)**




The climate footprint analysis which is carried out by utilities that participate at the advanced level, measures the total sets of greenhouse gas (GHG) emissions caused by the water utilities.This is measured by the number of kilograms $CO_2$ per $m^3$ direct revenue drinking water. The participants of this years' benchmarking exercise show a broad range of scores from 0,05 kg till 0,37 kg $CO_2$ equivalent per $m^3$ drinking water, with a median of 0,17 kg.

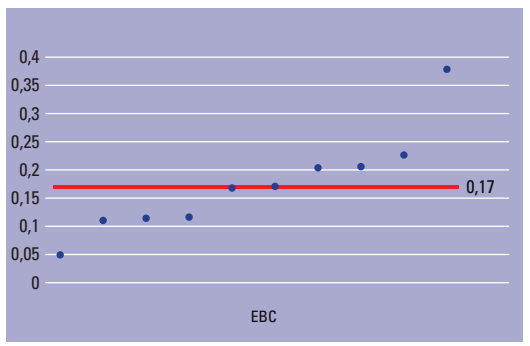


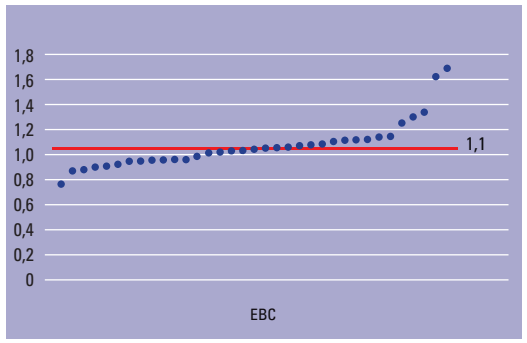

**Figure 6: Climate footprint per $m^3$ direct revenue drinking water (kg $CO_2$-eq./$m^3$)**

Since the climate footprint has increasing relevance for utilities, EBC will continue to further develop this topic in future benchmarking exercises.

### Economic sustainability

While making sure that water is ample available to the public, and taking their environmental footprint into account, water utilities need to make sure their activities are economically sustainable. In basic terms this means collecting sales revenues to cover total costs by a ratio of 1 or more. About half of the EBC participants meet this criterion. With a ratio below 1, utilities will have to rely on other sources of income (e.g. subsidies, reserves or income from other activities). These utilities are less sustainable on the long run.

**Figure 7: Total cost coverage ratio**




## Finance & Efficiency

The EBC performance assessment framework contains an extensive set of indicators on finance and efficiency. This set includes total cost, running cost, personnel intensity and charges. Since water utilities are committed to provide water of the highest possible quality at the lowest possible price, water charges are an important financial performance indicator. Average water charges for direct consumption are calculated by dividing total direct revenues by the sold volume. Many utilities have a tariff structure with a fixed connection fee and a variable rate per unit sold. As a result the price per $m^3$ a household actually pays will often depend on its consumption. The median price of water for the current EBC group is € 1,28 per $m^3$.

Personnel intensity is a relevant performance indicator on the efficiency side. It is measured as the number of full-time employees per 1000 properties. The scores on this indicator are computed using a standard 40 hour full-time working week. In the current EBC group the personnel intensity ranges from 0,41 to 1,51 FTE per 1000 properties with a median of 0,79 FTE.

## Asset management

The water supply sector is a capital intensive industry, which makes asset management highly relevant. Monitoring, maintenance and replacement of the assets are important factors in a utility's sustained health. Network age is one of the indicators used for this purpose (keeping in mind that materials, soil, water pressure etc. should be taken into account). The median network age of about 37 years indicates that the participants' networks are about halfway along their technical lifespan. However, there is a wide variety within the EBC group with mains ages between 24 and 60 years.

**Figure 8: Average water charges for direct consumption (€/$m^3$)**




**Figure 9: Average mains age (years)**

# WASTEWATER

# Wastewater

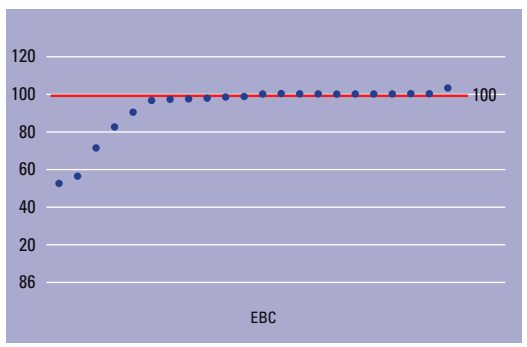
**This section presents an overview of the performance comparison of this year's benchmarking exercise for wastewater services. We use the same performance areas as for drinking water: water quality, reliability, service quality, sustainability and finance & efficiency. The data is gathered on the wastewater activities specifically. This means that measures and costs of other services that a participant may provide (i.e. drinking water or district heating) are excluded. The performance indicators shown in this section are only a subset of the available indicators.**

**The group of utilities that participated in the 2014 exercise is different from the one in 2013. Hence, the current group level results cannot be compared with those of last year. In the individual company reports, participants can however track changes both in their own and in their peers' performance.**

## Wastewater Quality: compliance with discharge consents is high

The wastewater (in many cases mixed with storm water) that is collected by a utility needs to be treated. The treated water needs to be in compliance with discharge consents to minimize the negative effect on the environment. These consents vary between and within countries, which means the same percentage can have different meaning for the different utilities. The compliance within the EBC group is generally high with a median value of nearly 100%.

**Figure 10: Wastewater treatment plant compliance with discharge consents (%)**



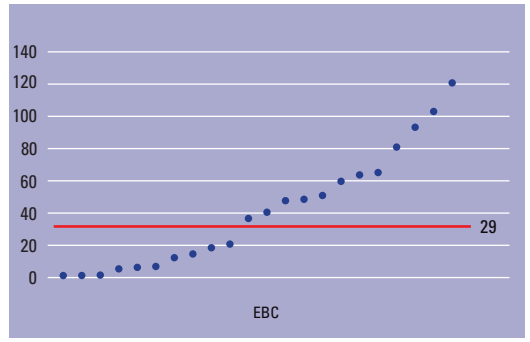





## Reliability: number of sewer blockages shows high spread within the EBC group

To assess wastewater reliability EBC is using sewer blockages as the main indicator. These blockages include all occurrences under the company's responsibility, whether they are due to collapse, root ingress, grease or debris. Utilities within the EBC group strive to improve monitoring. This may (at first) result in an increase in the detection rates, as not all blockages are currently properly registered. However, eventually this should improve the service of the water companies. Utilities can also reduce blockages by educating customers (especially in the case of blockages caused by grease). The results on sewage blockages vary widely within the EBC group between 0 and 120 blockages per 100 km sewer, per year, with a median of 38.

**Figure 11: Sewer and connection blockages (No./100 km sewer)**




## Service Quality: just under 2 complaints per 1000 inhabitants

Service quality for wastewater services is measured using the same indicators as for drinking water. The customer can file a complaint if the service of a wastewater utility is not up to the required standards. The majority of the EBC group scores very well with a median of 1,8 complaints per 1000 inhabitants. These complaints can be split into seven categories:

- Blockages
- Flooding
- Pollution
- Odour
- Rodents
- Customer account
- Other

Different types of complaints are occurring in different part of the wastewater chain. For instance, blockages and flooding complaints occur more often in the collection and transport mains (network), while the treatment facilities are often faced with complaints due to pollution, odour and rodents.

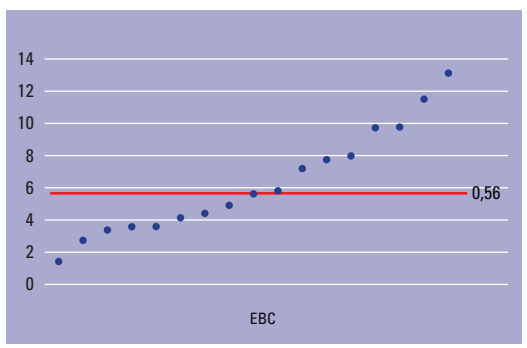
## Sustainability

Similar to drinking water services, the wastewater services are benchmarked on sustainability using the Triple Bottom Line approach which takes into account social, environmental and economic sustainability.

### Social sustainability:
### households spend less than 0,56% of disposable income on wastewater services

The EBC programme measures the social sustainability of wastewater services by calculating the share of the wastewater bill in the disposable household income. This measure gives us a good impression of the affordability of the wastewater services, accounted for differences in wealth between nations. The EBC group participants show a profound range from 0,17% to 1,32% with a median value for this indicator of 0,56%.

**Figure 12: Share of wastewater bill in disposable household income (%)**




### Environmental sustainability

EBC's benchmarking programme measures environmental sustainability with several indicators. Examples are the electricity used for treating wastewater as well as generating electricity from it, the percentage of the sludge generated in the treatment process that is utilised in a sustainable way or the frequency of use of overflow devices to surface water. In the current report we reveal the results for the energy consumption of the wastewater treatment plants, since this is where the energy consumption in the wastewater chain primarily occurs (as the collection of sewage tends to be mostly gravitational). The energy consumption of the majority of participants is fairly distributed between 23,6 kWh and 43,0 kWh, with a median score of 30,6 kWh. The consumption of the wastewater treatment plants can differ depending on the level of treatment, which in turn depends on the local discharge consents.

**Figure 13: Wastewater treatment plant energy consumption (kWh/p.e. served)**

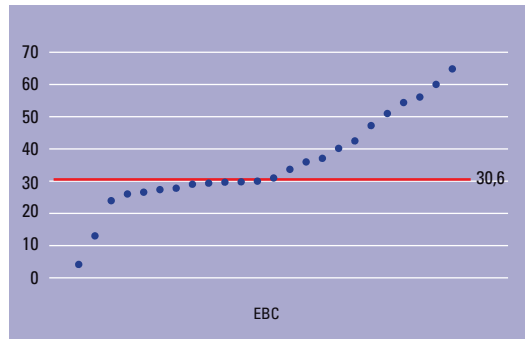
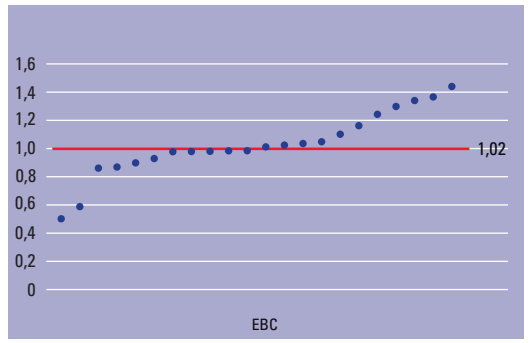



**Figure 14: Total cost service coverage ratio**



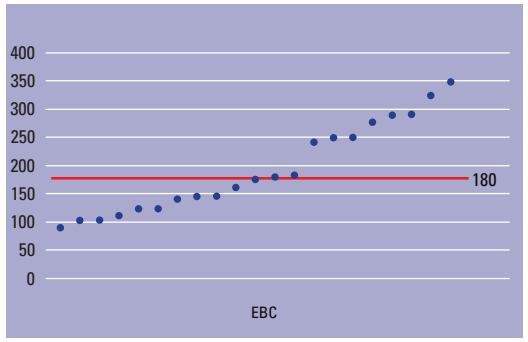

### Economic sustainability

Like with drinking water utilities, wastewater utilities need to make sure their activities are economically sustainable. In the EBC programme, total cost by sales coverage ratio is an important measure for economic sustainability. With this ratio, one can identify if a utility is able to recover its costs from its sales revenues. These revenues consist of all charges to the customers for the collection, transport and treatment of wastewater. With a ratio below 1, utilities will have to rely on other sources of income like subsidies, reserves or income from other activities. A little more than half of the 2014 EBC participants score above 1, making these utilities more likely to be economically sustainable on the long run. The scores range from 0,52 till 1,44, with a median of 1,02.

## Finance & Efficiency

Like for drinking water utilities finance & efficiency is a highly relevant topic for wastewater utilities that need to produce high quality water at the lowest possible price. There is a high variance between the EBC participants for the amount spent on sewage services per connected property. The highest charges registered are nearly four times higher (€ 349,60 per property) than the lowest (€ 90,00 per property). A similar picture is shown when charges are corrected for purchasing power parity, which corresponds with the distribution we see in affordability. Cost reduction (and, consequently, lower charges) are an important goal for most wastewater utilities. Hence this indicator is a great example of where exchange of best practices could be beneficial for many utilities.

**Figure 15: Average charges per connected property (€/property)**



# GOOD PRACTICES

# Good practices snapshots

## HAMBURG WASSER
## Plus Energy Wastewater Treatment Plant

**Lüder Garleff**
**Energy Management**

**Since 2011, the wastewater treatment plant of HAMBURG WASSER can show a balance between energy consumption and renewable energy production. Even an energy surplus has already been achieved with an expected increase for the next years. The combination of standard solutions and unconventional ideas resulted in a win-win solution for both ecological and economic challenges.**

HAMBURG WASSER operates Germany´s largest wastewater treatment plant. The WWTP 'Köhlbrandhöft / Dradenau' processes the wastewater of almost 2 million people and the industry of Europe's second largest seaport. With an electricity demand of 80 MWh per year it is one of the biggest public energy consumers of the city.

Following the urging challenges to counter the climate change, HAMBURG WASSER increased its efforts and in 2009 defined the official target to create an energy-self-sufficient WWTP until 2011. By this, the publicly owned company also supported the political targets of the Free and Hanseatic City of Hamburg as the European Green Capital of 2011. A strategy of both, reducing the energy consumption as well as increasing the own production of renewable energy, was developed.

Hamburg decided to invest in a high-tech solution to dry and incinerate the sewage sludge in a combined process with the usage of digester gas for electricity generation. The incineration plant named VERA was put into operation in 1998 as a showcase project of the World Exhibition 2000 in Hanover, Germany. What makes it special, is the very close interconnection of the heat and digester gas systems. Today, VERA is still the backbone of the treatment plant's energy supply.

VERA covers the high heat demand of the thermal sludge drying plant on a high temperature level. The residual waste heat is subsequently used to supply the digesters, all buildings of the WWTP and – since 2009 – even the neighbouring container terminal of the Hamburg seaport. By this, the heat demand was covered by 109% in 2013.

Concerning electricity generation, digester gas utilisation has become a general standard solution for wastewater treatment plants. In Hamburg this is also integrated in the VERA. Digester gas is combusted in a gas turbine of 5 MW and a gas engine of 2 MW rated power. The waste heat is then again used for steam production, feeding the same steam turbine as the sludge incineration. This combination leads to a very high electrical efficiency of 42%.

In addition, the amount of digester gas production was significantly increased by co-fermentation of various types of biological waste from industry and gastronomy. Since it became clear that the gas production would soon exceed the usage capacities, HAMBURG WASSER had to decide about the right technology for extending these capacities. The simple way – increase of electricity generation – was obviously not the best, since there was no use for the extra heat. Moreover the electricity self-sufficiency was already in sight. The solution is not to use the gas for self provision, but to sell it to the natural gas grid. Due to the different contents and qualities of digester and natural gas, a plant for upgrading the digester gas has been installed – one of the first plants of that technology, running on digester gas.

However, energy self-sufficiency could not have been gained solely by extending energy production. Reducing the energy consumption is at least as important – and even more valuable from the ecological point of view. HAMBURG WASSER has implemented a number of projects as a result of a systematic data acquisition and analysis of the energy demand of every single sub-process. A modern aeration system reduced the plants electricity demand by almost 18%, several additional projects lead to an overall saving of more than 20%.

The geographical situation of Hamburg not too far from the North Sea provides a considerable potential for using wind energy, a technology that has become very common in Germany through the last decades. However the idea of using it for self-provision of an industrial plant was quite exceptional and required new legal and contractual models for energy procurement and sale. Nevertheless, HAMBURG WASSER installed three wind turbines with an overall rated power of 8 MW. Even though wind power is obviously no reliable source, the yearly balance of energy consumption and production today reveals a remarkable energy surplus.

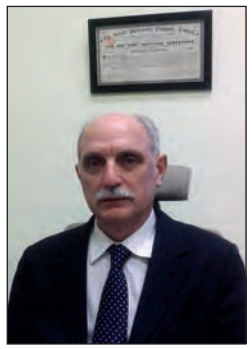
From 1995 the electricity consumption has been reduced from more than 100 GWh per year to less than 79 GWh per year. At the same time the renewable electricity generation increased to more than 80 GWh per year. Both trends will continue in the future as further projects are in the pipeline. At the final stage the electricity production is expected to exceed consumption by 15%. Concerning heat supply, a surplus of almost 10% has already been achieved since 2010.

Every single project of course has to pass a thorough payback analysis. If technical approaches are considered to be uneconomical, they are reassessed when changing frame conditions give reason to expect a positive result. Thus the savings of energy costs exceed by far the operation and capital expenditures of the implemented projects. The overall balance of energy procurement expenditures, operation and capital costs of energy production on the one hand and revenues from energy sale on the other hand will decrease from € 8,7 million in 2009 to about € 4,0 million in 2015 – and that almost without any public subsidies. Another economic aspect is almost as important: Energy costs now have become predictable for us and almost independent from volatile energy prices. After all, we think of our energy concept as a combined solution for both ecological and economic challenges.

# PARTICIPANTS EXPERIENCES

# Participants' experiences

## EMASESA, Spain



**Jose Manuel de la Puente Mendez**
**Director of Internal Audit & Control**

**EMASESA**
**Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla S.A. (Spain)**

"After several water sector meetings attended by EMASESA, in some of which (EUREAU (EU3), AEAS and others) the work carried out by EBC on benchmarking was discussed, the Management Board of EMASESA decided to participate in the benchmarking studies.
EMASESA is a national reference in water supply and wastewater and, within its objectives, it is trying to be at the forefront to keep that leadership.
To continue growing, we need to know our weaknesses and strengths, and work on them, as required by the Management Board of the company, consumers and stakeholders, who demand an ever-increasing quality in service and management.
The economic situation and social reality also demand that a public company must be extremely efficient in the management of public resources, and joining EBC's benchmarking programme is a great opportunity to see where there might be room for improvement for this, compared to the best performing utilities.
When we decided to join the benchmarking programme, we have been quite ambitious by choosing the most complete level (Advanced). This resulted in a lot of efforts to submit the required data, but in view of the results this has been worthwhile. The work of collecting the data already detected clear points of improvement when developing the methodology, including cross-fostering collaboration inside EMASESA.
Fortunately, a large team of professionals from EBC have helped us in the benchmarking exercise and on the other hand, there were a lot of experiences to share with other companies in the sector and best practices that allowed us to learn and to implement improvements to provide better service to the citizens and better manage resources.
We would like to thank the attention received at meetings held in Copenhagen and Antwerp by the EBC-team."





## IECBW, Belgium
## Intercommunale des Eaux du Centre du Brabant Wallon

**Nathalie Deconinck**
**Quality & Environment manager**

**IECBW is located in the south area of the Brussels Region in Belgium. The company is the third major utility supplying water services in the Walloon Region. IECBW treats and supplies drinking water to over 200.000 inhabitants (about 80.000 customer meters) along 1.750 km water mains spread over 13 municipalities. We also provide drinking water to other public companies.**

The company has experienced strong growth over the past 10 years, tripling its production volume and almost doubling its number of customer meters. In this context, the company has implemented in 2007 a quality management system which has allowed to control and to manage activities development without technical and financial difficulties. So, when the CEO of IECBW first heard about international benchmarking during a presentation of EBC at an IWA conference, it was obvious that the IECBW had an interest in participating in 2008 in such a process, as part of its performance improvement approach.

Before 2008, IECBW participated already in several Belgian regional benchmarking efforts, driven by the regulatory committee or by the water sector association. Our participation in EBC allows us to assess a large number of indicators at the European level, in order to identify more precisely our weaknesses and to target new areas for improvement. It provides also a platform for exchanging good practices of management and operations with other peer utilities of our own size.

At the end of the workshop in Antwerp, we particularly appreciated the new challenges that EBC is taking up for the next benchmarking exercise in order to keep moving towards continuous improvement beyond the performance assessment and also to make workshops the most effective with new reflexions on preparation and planning.

# PUB
# Public Utilities Board, Singapore

**Titus Seah**
**Planning Officer, Policy and Planning Department**

**As the national water agency, PUB not only supplies treated water, but also oversees the management of the entire water loop, including the collection and treatment of rainwater and used water, management of floods and the further treatment of used water for reuse.**

PUB has developed a Four National Tap strategy to ensure a sustainable supply of water for Singapore. These are local water catchment water, imported water, NEWater (reclaimed water) and seawater desalination.

2014 Marks PUB's 6th year of participation in the European Benchmarking Cooperation (EBC) Benchmarking Study. Continual participation in the EBC Benchmarking study has provided a useful and readily available platform for PUB to maintain the network and benchmark ourselves with top water utilities in the North European region, given that there is no such network found within Asia. As each European utility also takes turns to host the participants, this has provided us an opportunity to better appreciate the differences between PUB and the different water utilities in Europe.

We were excited to learn that EBC has been selected as a European Innovation Partnership Action Group, to encourage innovation in the region. This has allowed access to funding and partnerships to upgrade its benchmarking tooling and expand its reach. We are hopeful that the improvements to business analytic tools through EBC's online platform will allow us to better use PUB's data for internal and external benchmarking and analysis.



# Endnotes

1) **Share of (waste)water bill in disposable household income** is the percentage that the average (waste)water charges per property represents of the calculated household disposable income. The household disposable income is the amount of income left to a household after taxes have been paid, available for spending and saving. EBC's source for the calculation of household disposable income is Eurostat. It is calculated as the product of the mean equivalised net income (household income per adult equivalent) and the average number of adult equivalents per household.

2) **Average water charges** in EBC are calculated by dividing a company's revenues (direct revenues, residential, non-residential, or revenues from exported water), by the number of $m^3$ of authorized consumption, connected properties, or exported water (direct, residential or non-residential respectively).

3) **The total costs** are the sum of capital and running costs. Capital costs are defined as net interest plus depreciation, while running costs include personnel costs plus operational costs (external services, energy costs, purchased merchandises, leasing and rentals, levies and fees, exceptional earnings/losses, other operating costs).

4) **Average wastewater charges** in EBC are calculated by dividing a company's revenue (fees for collecting, transporting and treating the wastewater), by the number of properties connected to the sewer system managed by the utility (in apartment buildings, each household/property is counted separately).

# Colophon

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# EBC

## The European Benchmarking Co-operation

The EBC Foundation is a not-for-profit benchmarking initiative that facilitates water- & wastewater utilities in improving their services through benchmarking and learning from each other. EBC is structured as a foundation under Dutch law and is governed by a Board composed of representatives from DANVA, DWP (Danube Water Program), EurEau, Norsk Vann and Vewin.
EBC Foundation annually organises benchmarking exercises for water- & wastewater utilities in Europe and beyond. Next to the core programme for Western Europe, EBC facilitates regional benchmarking programmes in the Danube region in close collaboration with the local national water associations. Participation in EBC's benchmarking programme is on a voluntary basis. The programme is aligned with the IWA & AWWA benchmarking framework and applies the IWA Performance Indicator System. This provides a standard for exchange between the different programmes.

## What does EBC's benchmarking programme offer?

EBC offers a learning-orientated utility improvement programme. It consists of two consecutive steps: performance assessment and performance improvement. To serve both large and small utilities, experienced and less experienced ones, EBC has developed a Performance Assessment Model with three different levels of detail: basic, standard and advanced. While at the basic level only elementary statistics and performance indicators are investigated, the advanced level offers quite detailed indicators for deeper analysis. Participants can choose the benchmarking level that matches their aspirations and availability of internal information. Five key performance areas are analysed to provide a balanced view on utilities' performance:

- Water quality
- Reliability
- Service quality
- Sustainability
- Finance & Efficiency

Next to these key areas, EBC analyses the asset management area in particular.

To secure the high-quality standard of the programme, the EBC benchmarking team and the participating utilities closely work together on data collection, data quality control and data reporting.
In the performance improvement step, utilities meet their peers in the annual benchmarking workshop where they exchange knowledge and best practices in technology, management and operations.

DANUBE WATER PROGRAM
IAWD
Smart policies, strong utilities, sustainable services

DANVA
The Danish Water and Wastewater Association

EurEau

Norsk Vann

Vewin