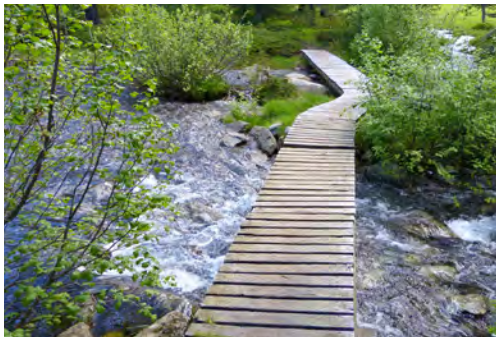
Yearbook 2018/2019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Yearbook 2018/2019

EUROPEAN WATER ASSOCIATION

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José Saldanha Matos

EWA President 2017 - 2019

Welcome to the 2018/2019 Yearbook of EWA, the European Water Association

The European Water Association (EWA) is a pan-European, non-governmental, non-profit-making, technical and scientific umbrella organization of national members that calls upon all relevant stakeholders and society in general to cooperate toward an increasingly sustainable management of water resources. To do so, EWA attempts to give relevance to currently fashionable topics while not forgetting old challenges.

Although Europe is by no means an arid continent, water scarcity affects at least 11% of the European population and 17% of its territory. Still, while a significant part of Europe is affected by water scarcity, a large number of cities are becoming increasingly vulnerable to flooding and related hazards in a trend mainly driven by factors including urbanization, changes in rainfall patterns, and complex and critical infrastructures and services becoming more exposed. Water resources observation, experimental work, and reliable modelling are needed to better understand the water cycle, and the interactions among its different components, with the end goal of better predicting the effectiveness of management options. The study of water resources has a long tradition; still, relevant issues are constantly being put on the spotlight: the fate of microplastics and other emerging pollutants, the effects of climate change, the challenges of the Sustainable Development Goals, or nature-based solutions and their role in environmental protection are only some examples. Only by addressing them can our community face the challenges and benefit from the opportunities of a new global water market. Ensuring availability and improving water quality under uncertain scenarios is a critical element of the 2030 Sustainable Development Goals, playing an essential role in the reduction of poverty, the protection of public health, the promotion of a sustainable growth, and contributing to create a society that is more stable, secure, and displays greater long-term resilience in respect to water and environment.

Capacity building and innovation are crucial for sustainable development and essential for supporting a smart management of water resources, boosting the economy, creating employment and generating value for society. Continued education, and increased sharing of experiences and "know-how" are needed, as well as stronger science-society connections and interactions. That is why the EWA Management Committee agreed very recently (February 2018) on proposing to the EWA Council to include in its statutes a new category of EWA member, the research member, open to any research unit, such as research institute, department or research laboratory investigating on water and related topics. Additionally, a new EWA Working Group (WG) was also recently created. The European Qualification Framework (EQF) WG, about technical and vocational education and training in the water sector had its first meeting in Berlin last year.

In line with its tradition, the 2018-2019 yearbook includes brief references to the EWA organization and present information about its national and corporate members. Furthermore, this yearbook also contains technical and scientific articles tackling some current hot topics, including current water challenges and Europesn Answers by MEP Birgit Collin-Langen: "Securing a healthy environment after Brexit", by A. Chisholm; "How to expand water business beyond Europe", by Bjørn Jensen; "Restoring rivers and creeks environmentally and reducing the flood risk – An example from the most industrialized region in Germany", by Georg Johann; "Paving the way for an innovative financing model for water policy in France", by Maria Salvetti; "Policies, innovation and networks for enhancing opportunities for the China-Europe water cooperation", by Starkl et al. and "Climate change and water resources: call for smart climate adaptation strategies and innovation", by Patrick Willems. EWA express its gratitude and acknowledges the authors for these interesting and relevant contributions.

Finally, I would like to express my sincere thanks to our team in Hennef, Germany, led by the Secretary General Johannes Lohaus, to our Vice President Bjørn Jensen, to our Past President Károly Kovács, to our Management Committee and Standing Committees, to our Council Members, and to our experts involved in the Working Groups. Their engagement in the Association's activities is highly appreciated and the generous gift of their time priceless.

José Saldanha Matos

Lisbon, the 24th of March 2018

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THE EUROPEAN WATER ASSOCIATION
Clean Water for Europe

The European Water Association (EWA) is an independent non-governmental and non-profit organization promoting the sustainable and improved management of the total water cycle and hence the environment as a whole.

It is one of the major professional associations in Europe that covers the whole water cycle, wastewater as well as drinking water and water and wastewater treatment related wastes. With member associations from nearly all European Countries, EWA includes most of the current European Union Member States as well as Norway and Switzerland. Today, EWA consists of 23 European leading professional organisations in their respective countries, each representing professionals and technicians for water and wastewater utilities, academics, consultants and contractors as non-governmental and well as a growing number of corporate member firms and enterprises. Thus EWA represents about 50,000 professional individuals working in the broad field of water and environmental management.

Organisation and Structure

The highest authority of the EWA is the Council – it has the executive power of decision. Each member association (22) is represented on the Council and these representatives meet annually to discuss and plan the activities of the association. The smaller Management Committee has the responsibility for developing policy and is in charge of the daily work of the association, supported by the Secretariat. The Association is represented by the President, who chairs the Council and the Management Committee. The Secretary General executes the day-to-day operations of the Association. In addition, Standing Committees and Working Groups support the work of the Association.

The EWA Standing Committees

From the very beginning the Association has laid emphasis on the exchange of information and knowledge between professional experts. Through this exchange of knowledge, the EWA contributes to a sustainable water management: safe water supply and the protection of water and the environment. This was achieved by the organisation of numerous conferences and workshops taking place all over Europe and covering a very broad range of water related topics such as European legislation (themed areas such as Water Framework Directive, Groundwater Directive, Sewage Sludge Directive etc.), technical questions like for example the significance of small wastewater treatment plants in rural areas, or scientific conferences, like Waters in Protected Areas and other integrated approaches. The European Water Association organizes conferences and symposia at regular intervals, on events such as the International Trade Fair (IFAT) in Munich, as well as its own EWA Brussels conference. An increase in the number of members from Central and Eastern Europe (accession countries), has raised the interest for events dealing with water protection issues.

All this work is achieved through the different Committees and Working Groups that were established and which are adapting their scope according to the needs. They are based on voluntary work of experts coming from the different National Member Associations and working together on various subjects of current interest in the water and environmental field.

European Policy Committee (EPC)

The committee follows the work of the European Commission and arranges regular meetings with officials in the Commission, responsible for activities of relevance to water management. The committee gives comments and advice to official European institutions on behalf of its members. The EWA is attending meetings of the Strategic Co-ordination Group under the WFD Common Implementation Strategy. Furthermore the EWA is in close contact with other European associations and institutions.

The objectives and responsibilities of the European Policy Committee (EPC), under the guidance of the governing bodies of the European Water Association, and within its rules of procedure, are the following:

- Organise and coordinate relationships of EWA with European level bodies, and especially with bodies of the European Union;
- Facilitate and create the necessary and useful flows of information amongst the persons and groups representing EWA towards European level bodies, as well as between the former and the National Associations (NA), members of EWA;
- Identify emerging issues and important trends in water related European policies and issues, which are of interest to EWA and its members, in order to allow EWA to anticipate future changes and to contribute efficiently to European policy development;
- In consequence, and in conjunction with the European Technical and Scientific Committee (ETSC), propose the evolution of thematic activities and actions of EWA.

European Technical and Scientific Committee (ETSC)

The ETSC provides a focal point for communication and co-operation between European practitioners and researchers concerned. Under the ETSC several working groups are organised. These working groups are installed according to the needs of the association. Currently there are working groups on: Climate Change, Groundwater, River Morphology, Sewage Sludge and Sustainable Flood Management. The work results in technical and scientific papers and documents.

The committee is also responsible for the organisation and sponsorship of workshops, seminars, conferences and symposia.

The Network of Experts

Although the working groups already present a focal point for the exchange of information, they only involve a limited number of persons out of the approximately 50,000 members assembled in the EWA National Member Associations. Additionally, the working groups cover mainly specific topics.

EWA Working Group: European Qualifications Framework in the Water Sector

The European Qualifications Framework (EQF) is an initiative of the European Union (EU), acts as a translation device to make national qualifications more readable across Europe, promoting workers' and learners' mobility between countries and facilitating their lifelong learning. The EQF aims to relate different countries' national qualifications systems to a common European reference framework. Individuals and employers will be able to use the EQF to better understand and compare the qualifications levels of different countries and different education and training. Since 2012, all new qualifications issued in Europe carry a reference to an appropriate EQF level. (Wikipedia)

The starting point for Germans to use the EQF – European Qualifications Framework was actually initiated on May 1st, 2013 when the German Qualifications Framework came into force.

This raises the question, how the requirements of a common qualification framework will be executed within the European water sector, granted the fact that they are based on a voluntary commitment in each country.

Initiated by the German Association for Water, Wastewater and waste (DWA), the working group was founded in March during the WASSER BERLIN INTERNATIONAL 2017. The working group consists of 25 members from 17 different European countries such as Austria, Spain, Portugal, Finland, Norway, Hungary and the Netherlands. The working group intends to compile existing educational regulations within the different countries and publish the findings into a final report. The overall goal is to be able to compare existing qualifications in order to facilitate labour mobility across the borders. The group will meet annually to discuss findings and moreover, communicate by means of skype or mail. Chairman of the new working group is Rüdiger Heidebrecht, Head of Department Training and International Cooperation within the DWA. Interested parties on this topic are more than welcome to contribute.

Please contact the EWA Secretariat for more information.

Recent Activities:

1. EWA at the trade fair WASSER BERLIN INTERNATIONAL 2017 and First EWA European Day

On March, 30th, 2017, the European Water Association organized the First European Day on the premises of the WASSER BERLIN INTERNATIONAL 2017. Europe has its challenges in the water sector; it is time to face them. In the first session of the one-day conference called "Water Challenges in Europe", among others, the topic of "Brexit" and its consequences for Britain and hence Europe was explored. The second session discussed the Innovative Solutions for Sustainable Water Services in Europe, such as the modernization of city drainage systems.

The conference was free for all trade fair visitors. The presentations can be found on the EWA website.

The EWA met at Wasser Berlin

2. 2nd EWA Spring Conference: Sanitation Approaches and the Sustainable Development Goals, 10-11 May 2017, Lisbon Portugal

The Conference, organised under the patronage of the Portuguese Water Association, APESB, focused upon sanitation systems covering the full range of alternatives from high- to low-tech options and from de-centralised to centralised solutions. The event was intended to make proven technology available with the ultimate aim of achieving more sustainable and affordable wastewater systems. The event was visited by more than 100 participants including participants from Brazil and Africa.

3. Conference "Bathing in the City" at the Green Capital of Europe 2017 – Essen

On 7 September 2017, around 50 water professionals met at the Ruhrverband in Essen to exchange experiences on the topic of safe swimming in urban rivers and lakes. In addition to the requirements that bathing water bodies must meet today, "Best practice" examples from Copenhagen, Switzerland and Essen were presented and in depth discussed. In his opening speech, Professor José de Saldanha Matos, President of the European Water Association, emphasized that "the high interest shown in the Conference in Essen is a sign that the growing popularity of swimming in rivers is registered and the wishes of the population have reached the water experts". The Mayor of the City of Essen, Thomas Kufen, welcomed the participants of the conference.

During the opening, the Mayor of the city of Essen, Thomas Kufen, emphasized: that: "Bathing in the Ruhr is a unique project,

allowing everyone to experience our "blue miracle"." This sentence illustrates not only the desire of the population to use the river Ruhr for swimming, but also to raise awareness of our waters among the people.

Bathing in the City: Group Excursion to Lake Baldeney

The project "Swimming in the Ruhr" was regarded as a role model for other European cities. The guidelines for bathing in streams in the project "Safe Ruhr" can be used as a blueprint for potential future bathing areas.

4. 13th EWA Brussels Conference and Awarding of the Dunbar Medal

William Dunbar Medal Ceremony

On the eve of the 13th EWA Brussels Conference, the European Water Association (EWA) awarded the William Dunbar Medal. Since 1973 the Dunbar Medal is donated by the Messe München GmbH and awarded by the European Water Association. It is given in remembrance of William Philips Dunbar, born in 1863 in Minnesota (USA), who was appointed as Director of the Government Hygenic Institute in Hamburg in September 1892 to assist in managing the disastrous cholera epidemic. Dunbar improved the detection procedure for cholera and other pathogens and his pioneering improvements in city sanitation made him an authority that is still internationally recognised in the sector. The Award in 2017 was given to Professor Milenko Roš, born in Celje, Slovenia. His academic background is a Ph. D. in Chemical Sciences, followed by employment at the National Institute of Chemistry at the Laboratory for Chemistry, Biology and Technology of Water in 1971. At the same institute he was the Head of Laboratory for over 25 years until retirement in 2009.

The Dunbar Medal Award Ceremony: from the right; José Matos, EWA President; Milenko Roš, Dunbar Medal Winner; Stefan Rummel, Managing Director MMI, Johannes Lohaus EWA General Secretary

5. 13th EWA Brussels Conference

Held in cooperation with the DG Environment of the European Commission, the main objective of the annual EWA Brussels Conference is to establish a dialogue between the European Commission and European water professionals and stakeholders.

The 13th EWA Brussels Conference dealt with the latest update on EU Water policy. Key note speaker were Esther de Lange, Member of European Parliament and Chair of the MEP Water Group, as well as Bettina Doeser, Head of C1, Clean Water at DG Environment will contribute. In session 1 the achievements and challenges of the Water Framework Directive were presented. On day two, the topic Water as a Resource in Session two, and water as an interdisciplinary challenge was discussed in Session three.

6. EWA Seminar on EU Water Policy, 8 November 2017

During past years the EWA Water Policy Seminar has proven to be a good information event which provides an overview on EU institutions, their interaction and decision-making processes, as well as possibilities, paths and legal rights for access to information and documents, and a summary of water-related policy and legislation. This year the event was organised successfully subsequent to the 13th Brussels Conference.

Upcoming Events and Activities

1. 6th Joint EWA/JSWA/WEF Conference "The Resilience of the Water Sector"

The tri-annual joint conference is co-organized by the European Water Association, the Japanese Sewage Works Association (JP) and the Water Environment Federation (WEF). The 6th Joint Conference is taking place from 15th to 18th May during IFAT 2018 on the topic "The Resilience of the Water Sector".

Resilience is a strong emerging theme within the water sector. From long term water resource availability and water quality impacts of droughts, to the need for resilience against disruptive events with little or no warning such as floods and earthquakes, these events not only disrupt water sector infrastructure and operations, they can also affect other infrastructure that a reliable water sector depends on. This includes electrical power supplies, telecommunications, and transportation as well as disruption to the supply chain and workforce. The effects of such events can be long lasting and far-reaching, impacting customers, the environment, and business performance. Ultimately, resilience is a significant business risk management as well as an infrastructure planning issue. This joint conference will explore ways in which the sector in its broadest terms is developing resilient systems, assets, and operations so that business continuity risk is well managed in the face of adverse conditions. The intention is to share experience from across the world covering: real life examples of lessons learned from major events; good response and recovery practices; and current activities that are strengthening resilience.

The presentations and papers of the conference will be summarized in the conference proceedings.

The participants of the conference have the opportunity to take part in the technical and cultural field trip taking place on Friday, 18th May 2018.

We will visit the Walchensee storage powerplant, situated outside of Munich. The imposing Walchensee storage power plant is considered to be the cradle of industrial power generation in Bavaria. Completed in 1924, it was one of the largest hydropower plants in the world with acapacity of 124,000 kilowatts (124 megawatts). Even today, with annual production of around 300 million kilowatt hours (300 gigawatt hours), it is one of the largest high-pressure storage power plants in Germany. Since 1983 it is a protected industrial monument.

Members of the EWA Management Committee (MC) for the period July 2015 – May 2017

President
Prof. José Saldanha Matos (PT)

Vice president
Bjørn Kaare Jensen (DK)

MC Member
Petrit Tare (AL)

MC Member
Raymond Erpelding (LU)

Chair Woman of the "European Policy Committee" (EPC)
Wendy Francken (BE)

MC Member
Maria Salvetti (FR)

Past President
Károly Kovács (HU)

Honorary Treasurer
Karl-Heinz Brandt (DE)

Chairman „European Technical and Scientific Committee" (ETSC)
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The William Dunbar Medal

This prestigious medal is awarded to an individual of a member country of the EWA, in recognition of his or her outstanding contribution in applied technical development in the field of sewage and waste treatment and disposal. This Award, donated by IFAT, the international trade fair for water, sewage, refuse, and recycling, which is organised by the Messe München International, has been adopted by the European Water Association. It was previously presented every two years on the occasion of the EWA Symposium held in conjunction with the IFAT event, has now become a highlight at the EWA Brussels Conference as was organised in 2015.

The award consists of a gold medal and a certificate. The medal bears the portrait of William Dunbar on one side and on the other the logos of the EWA and IFAT. It is given in remembrance of William Philips Dunbar, born in 1863 in Minnesota (USA), who was appointed as Director of the Government Hygenic Institute in Hamburg in September 1892 to assist in managing the disastrous cholera epidemic. Dunbar improved the detection procedure for cholera and other pathogens and his pioneering improvements in city sanitation made him an authority that is still internationally recognised in the sector.

William Dunbar Medal – Award Winners

Year	Award Winner	Country
1975	Dr. A. L. Downing	UK
1978	Dr. Ir. Aale Pasveer	NL
1981	Prof. Dr. sc. nat. E. A. Thomas	CH
1984	Herbert A. Hawkes	UK
1987	Prof. Dr.-Ing. Wilhelm von der Emde	AT
1990	em. o. Prof. Dr.-Ing. habil. Franz Pöpel	DE
1993	Geoffrey Ashworth Truesdale	UK
1996	Prof. Dr.-Ing. E.h. Klaus R. Imhoff	DE
1999	Prof. Mogens Henze	DK
2002	Prof. Dr.-Ing. Rolf Kayser	DE
2005	o. Prof. Dipl.-Ing. Dr. techn. Helmut Kroiss	AT
2008	Prof. MSc, PhD, DSc Jiří Wanner	CZ
2010	Prof. OBE, PHD, FCIWEM, CWEM, CEnv Peter Matthews	UK
2012	Philippe Duchène	FR
2013	Prof. Dr.-Ing. Karl-Heinz Rosenwinkel	DE
2015	Prof. Dr. László Sómlyódy	HU
2017	Prof. Dr. Milenko Roš	SI

The recipient of the William Dunbar Medal 2017: Milenko Roš

Professor Milenko Roš was born in Celje, Slovenia. His academic background is a Ph. D. in Chemical Sciences, followed by employment at the National Institute of Chemistry at the Laboratory for Chemistry, Biology and Technology of Water in 1971. At the same institute he was the Head of Laboratory for over 25 years until retirement in 2009. He introduced the etalon for chemistry and organised interlaboratory comparisons for Slovenian laboratories that are involved in wastewater monitoring and analyses in the field of wastewater. He has written publications in Slovenian language in the field of wastewater treatment and terminology in the field of water, codes and descriptions in the field of biological wastewater treatment. Professor Roš is highly recognised for his academic merits in the water and the wastewater sector in Slovenia. He is the author of "Respirometry of Activated Sludge" (Taylor & Francis, USA 1993), as well as other publications in the field of wastewater treatment and terminology in the Slovenian language. Professor Roš co-founded and supported the Slovenian Association for Water Protection (SDZV), he was a member of the IWA Governing Board from 1995-2011 and again in 2014, and last but not least, the initiator to become a member of the EWA.


CERTIFICATE

In recognition of his outstanding services to the applied technical development in the field of wastewater treatment and the protection of the environment

The DUNBAR MEDAL

presented by IFAT is awarded to

PROF. DR. MILENKO ROŠ

by The European Water Association (EWA) on the occasion of the 13th EWA Brussels Conference.

EWA

Brussels, 6th November 2017

José Manuel de Saldanha Gonçalves Matos, President of EWA

Dr Fábio Tatàno, Chairman of ETSC

A. Chrisholm

Alastair is responsible for CIWEM's policy, parliamentary and communications work, including its range of expert technical panels. Current areas of current focus include the UK's progress in achieving Sustainable Development Goal 6 (Water), the implications of Brexit on environmental management and policy, integrated catchment management, sustainable drainage systems and flood risk management.

Securing a Healthy Environment After Brexit

There remains much uncertainty regarding how far Britain will be subject to EU law and regulation, or the European Court of Justice, once it leaves the EU. But British politicians are making encouraging and reassuring pledges that regulatory standards which relate to the environment will be maintained or even increased and are setting out bold ambitions for the future of Britain's environmental health. It is now vital that they are held to their word.

In the meantime, there is much to distract our politicians. Brexit has been described as a regulatory unravelling like no other any UK government has ever had to undertake. Its complexity is astounding, with thousands upon thousands of pieces of regulation being required to be moved from the EU to the UK statute book. Of these (estimated to be more than 12,000) a quarter or so relate to the environment and must be considered by the Department for the Environment, Food and Rural Affairs.

This is a department which has suffered from public spending cuts, budget and staff reductions of approaching 40% since 2010. Despite a frantic recruitment drive to bring personnel back into the department, it is easy to understand that beyond Brexit and everything it involves, there is far less capacity than would be desirable to deal with other current and pressing domestic and European environmental challenges.

There are many such challenges. In the latest round of reporting on Water Framework Directive compliance, it was found that 86% of our river water bodies in England are failing to achieve good ecological status. And our government has been dragged through the courts (and lost) three times for failing to put in place a sufficiently ambitious plan of action to tackle repeated infringements of EU limit values for air pollutants. Our agricultural practice is jeopardising the health of our soils and our wildlife remains in decline. Meanwhile the UK faces a housing supply crisis which Government is aiming to tackle largely by streamlining regulatory requirements for developers as far as possible.

Environment-focused programmes in the EU have always provided a long-term and stable direction of travel which have perhaps not provided in an optimal way for the specific needs of the UK. However, at the same time they have helped to smooth out the unpredictability and uncertainty associated with policy making and political cycles at the domestic level and have served to set a level of ambition which it is difficult for national governments to disregard. In addition, the EU provides for strong access to environmental justice and this will not be available to UK civil society in the same way after Brexit as things stand at the present time.

The UK, freed (to an extent at least – though we will not know how free we will be until the final Brexit deals are agreed) from a requirement to comply with such programmes and ambition, will need to set its own strong policies and ensure that regulatory instruments and bodies are in place to enforce them, plus provide adequate access for citizens to environmental justice. There is no choice in this if we are to reverse the decline in health of much of our natural environment and indeed, the health of our society.

Importantly, unless these are put in place before exit day, there will be a significant gap in the protections that we need so there is a real requirement for concerted and urgent action. Many bodies (particularly NGOs) who work on the environment are joining together to call on Government to take this urgent action, but progress through Parliament of the necessary legislation is not rapid. This is quite understandable - the EU Withdrawal Bill which is the main legal instrument for bringing the EU laws over to the UK legislature has been subject to roughly 400 proposed amendments and 60 proposed new clauses, despite being a quite short piece of legislation itself. It is controversial to say the least! There are a range of other pieces of legislation also required to be passed regarding issues such as fisheries, agriculture and nuclear safety. So, there is little time for much else to be considered in parliament despite the pressing need.

Much of the UK Government's strong ambition was set out in the eagerly awaited 25 Year Environment Plan. This is a high-level strategy which sets out where Government wants the environment to be in a quarter of a century. It received mixed reaction, ranging from high praise through to criticism of insufficient ambition. Nevertheless it is the first step in long-term planning on the environment, albeit primarily focused on England. However, for the plan to stand any hope of driving the right action over this timescale, progress will need to be independently scrutinised and governments throughout that 25-year period held to account on its delivery.

Government is due to consult on the form of the new scrutiny bodies during the spring and early summer of 2018, but it is highly uncertain that this will then leave sufficient time to allow them to be established and to get up and working to provide adequate safeguards effectively from March 2019. Perhaps a transition phase might provide some assurance here and require compliance with EU law and jurisdiction of CJEU until a later date, but this is a risk from an environmental perspective.

Many of those who advocated Brexit have championed the opportunities open to Britain in leaving the EU. This is obviously a contentious debate but perhaps one area where there exists some of the most extensive opportunity is in relation to agriculture. Fisheries offers another potentially significant area of opportunity, but it is likely that this will be subject to intense negotiation linked to trade, therefore opportunities for Britain to forge its own path and assert its authority fully over its waters will end up relatively limited.

Agriculture though, or at least the land management practice associated with it, driven by subsidy regimes, is less transboundary in nature and therefore can be subject to a new and quite different direction to that taken on the continent. The Government has recently published a 'command paper' for consultation in advance of the forthcoming Agriculture Bill, due this summer. It marks the start of formal proposals on the regime which will replace the Common Agricultural Policy (CAP).

Whilst the paper is not comprehensive in its detail and proposals at this point, this is an issue which will be highly politically important in coming years as plans and approaches are crystalised. Agricultural land management is fundamental to the health of much of Britain's wildlife and the beauty of its landscape, indeed the national identity. It has not successfully delivered positive outcomes against all such ends since the middle of the last century. And whilst Government has pledged to honour the level of agricultural subsidy available to farmers out to 2020, beyond that point it appears that there could be significant change.

This would provide a useful point of reference for EU member states, to observe the success or otherwise of an alternative approach to delivering high quality agricultural produce through a different mechanism of paying farmers to deliver environmental husbandry, at the same time as maintaining farm viability.

The emphasis from Government at the present time is strongly placed upon the need to deliver public benefits for public money. Land area-based payments under the CAP (so-called Pillar One payments) are proposed to be phased out with any payments which are made (and at the present time there are certainly no guarantees offered that there will be subsidies as such, or at what scale any payments might be), being focused on the kinds of activities that are currently supported through Pillar Two payments.

There are proposals to make the new system outcomes-focused and on paying farmers – or any other land managers but farmers represent the most extensive body of active managers of the land - specifically against the delivery of these outcomes. This would require an ability to assign an appropriate economic value to any given 'public benefit' outcome and pay accordingly for its delivery. The kind of public benefits that are being discussed as examples are improvements to water quality, soil fertility, biodiversity or flood resilience. A key challenge would be to ensure that such outcomes were coherent at a spatial scale. There would clearly be many lessons to be learned as such an alternative system matures, both for Britain and for those observing from overseas.

And on the subject of standards, it cannot be emphasised strongly enough that anything other than maintenance or even increasing of standards would be catastrophic for the UK environment. Many farm species and ecosystems are on the verge of collapse. Any weakening of standards or practice at this point in time would be the final nail in the coffin for wildlife teetering on the brink.

Fears coalesce around the idea of a regulatory race to the bottom, wherein environmental, chemicals, animal welfare, food safety and other standards might be weakened post-Brexit in a bid to oil the wheels of future trade deals with the world outside the single market. This approach is espoused most strongly by the European Research Group of around 62 Conservative Party politicians who have called for full regulatory autonomy from the

EU and the ability to begin negotiating and agreeing free trade agreements from the basis of WTO rules immediately.

However, Ministers, including the Prime Minister have sought to provide encouragement in relation to standards. Theresa May has talked of "managed regulatory divergence" (which appears not to be acceptable to EU negotiators thus far) but within the context of maintaining overall standards in relation to anything relevant to trade (and much environmental compliance would be relevant).

In perhaps a surprising move, Brexit Secretary David Davis told a grouping of business leaders in Austria that "we will continue our track record of meeting high standards after we leave the European Union", and that fears of an "Anglo-Saxon race to the bottom with Britain plunged into a Mad Max-style world borrowed from dystopian fiction" are "based on nothing".

Environment Secretary Michael Gove has been clear and consistent on this position for a good while, unequivocally fronting up to International Trade Secretary Liam Fox on the issue of the possibility that the UK might accept chlorinated chicken from the USA under a future trade agreement. He again made clear at the National Farmers' Union annual conference that the new agricultural regime will maintain standards, asserting "we want to work together to ensure that we develop world-leading animal welfare and environmental standards."

Gove added that "I'm on record as saying, and I completely want to underline here, that I believe the most important public good we should pay for is environmental protection and enhancement." And he noted that "…soil degradation costs the economy of England and Wales £1.2 billion every year. Soil is a building block of life, alongside water and air and we need as a country to invest in its health."

So, there are genuine reasons to be hopeful that whatever else Brexit might bring, it may herald a new environmental land management mechanism which will be of interest to our European neighbours by virtue of its differing approach, and which will be aligned to the high standards that the EU has promoted.

But it will require long-term commitment and mechanisms to ensure that governments can be held to account and forced to uphold ambitious policy and high standards during the undoubtedly challenging times that will occur as a result of such a profound period of change. We are entering a critical phase of the Brexit process now, during which the regulatory foundations for the future health of our environment, economy and society must be laid, and laid correctly.

The UK must work to ensure that our relationship with the EU is positive, that we learn from and share experience on those areas where we do diverge, but that we cooperate as far as possible to maintain and enhance our environment which is common in so many ways and will remain so. CIWEM and a great many other environmental organisations throughout the UK will be calling on our parliamentarians to take the decisions needed to ensure that this occurs, and we call on those throughout the rest of Europe to do the same. The EWA is one such voice and we look forward to continuing our strong relationship as this period of change plays out.

Dipl.- Hydrologe Georg Johann
Leader Hydrology & Hydraulic Emschergenossenschaft / Lippeverband and
Managing Director HochwasserKompetenzCentrum e.V.

Flood risk management
Development of FLOODLABEL · Environmental improvement of rivers and creeks

Links: www.floodlabel.com · www.fghw.de · www.eglv.de · johann.georg@eglv.de

Restoring Rivers and Creeks Environmentally and Reducing the Flood Risk - An Example From the Most Industrialised Region in Germany

In Germany, measures are being taken within the framework of European directives to reduce the risk of flooding using natural water retention. These measures apply the approach of sustainable ecosystem services. In addition to reinforcing the self-cleaning processes (retention of phosphorous, nitrogen and carbon) and increasing the biodiversity, these measures also have a significant social dimension (improving the quality of life in cities and towns through more attractive urban quarters and the reduction of heat islands). The realisation of such measures requires interdisciplinary planning. The dialogue required to this end between the different specialist disciplines with all their various perspectives is conducted co-operatively within the framework of the German Association for Hydrological Sciences (www.fghw.de). In the HochwasserKompetenzCentrum (www.hkc-online.de) too, methods relating to public discourse, participation and acceptance for water-meadow landscapes as retention spaces are being developed and realised.

The largest project in Europe for the environmental improvement of rivers and creeks is the restoration of the largest industrial river system in Germany, the Emscher, which flows from Dortmund to Duisburg and into the Rhine. In the catchment area with its population density of 2,700 residents per km², 130 of 350 planned kilometres of rivers and creeks have been environmentally restored by the Emschergenossenschaft (www.eglv.de).

Due to dense building development and subsidence as a result of coal mining, the catchment area is characterised by a very high flood risk. Flood risk management thus plays a pivotal role. The further expansion of technical protection measures is reaching its limits in the densely populated Emscher region due to the lack of available space. Thus, the mission is to optimise the existing technical flood protection systems, but more especially to create natural water retention in order to reduce the flood risk.

In order to depict the change in the run-off characteristics resulting from the environmental rehabilitation of the rivers and creeks, hydrological long-term simulations (over 60 years) and statistical evaluations are performed. Figure 2 shows the comparison of a flood wave of an Emscher tributary in the technically developed condition compared to the environmentally improved condition. The flood wave is significantly reduced .

Fig. 1: The Emscher in Dortmund, left: technically developed (1952) right: after environmental restoration (2016).

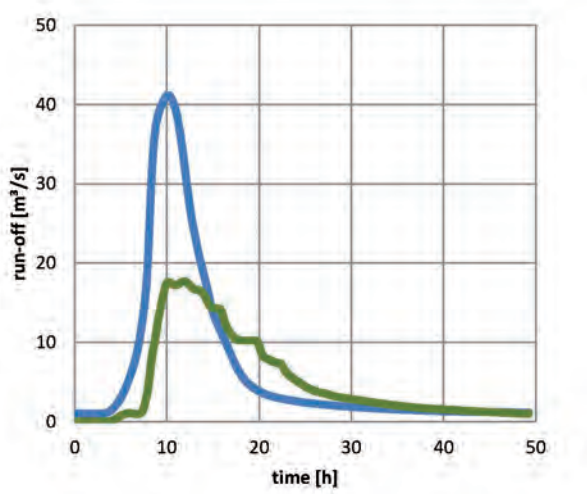


Fig. 2: Comparison of a flood wave of the Emscher tributary, Boye, in the technically developed condition (blue) and the environmentally improved condition (green).

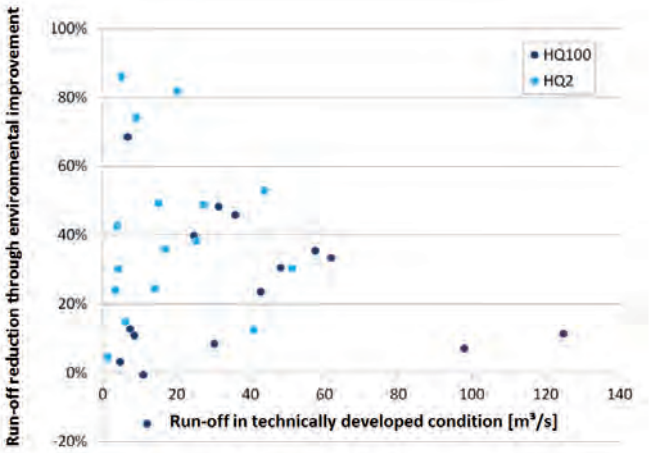


Fig. 3: Change in the floodwater run-offs of the Emscher tributaries for HQ2 and HQ100 (2 points for each body of water) as a result of the environmental improvement in relation to the technically developed condition

Figure 3 shows the percentage run-off reduction of the environmentally improved condition compared to the technically developed condition for HQ2 and HQ100. The mean value of the run-off reduction is 41% for HQ2 and 22% for HQ100. There are also some cases where the run-offs have been increased by the environmental improvement or where run-off reductions are scarcely detectable. Here, the capacity of bridges and culverts were increased for the purpose of flood protection. Thus, the flood risk is lower upstream of the structures, but there are higher run-offs where it opens into the Emscher.

The high retention effect of the environmentally improved condition results from the combination of environmental river design and decentral retention measures in the catchment area.

The water level in the rivers does not drop to the same extent despite the lower run-offs, because the flow speeds decrease due to the higher proportion of vegetation in the river. At many places, it has proven possible to improve flood protection through the environmental improvement of the Emscher system, thereby proving that the environmental restoration of rivers significantly reduces flood run-off. It shows that the creation of natural water retention is an indispensable component of flood risk management.

Maria Salvetti

Maria Salvetti has worked as an independent consultant for the World Bank at several occasions since 2014. She also collaborates with the "Economics of Public Private Partnerships" research chair from the Sorbonne Business School since 2013. Within the framework of H2020 program, she presently coordinates, for the Sorbonne Business School and with Portuguese and English partners, the implementation of an international Centre of excellence on water based in Lisbon. Former chief economist for the French national agency for water and aquatic environment (Onema), Maria Salvetti produced the first report on water services performance which was presented during the World Water Forum in March 2012. She also worked on several environmental and socio-economic studies required by the European water framework directive (WFD). From 2008 to 2010, she worked for the largest water service in Europe (SEDIF) providing economic and financial advice in the preparation of the service management contract. She has also worked as a principal economist for Seine Normandy water Agency (France) and the Environment Agency (England & Wales).

Paving the Way for an Innovative Financing Model for Water Policy in France[1]

1 A complete study on the French economic model to finance water policy will soon be published by the National Union of Industries and Companies in the Water and Environmental Sector (UIE).

In a context of water consumption reduction, of high health and environmental standards, of emerging micro-pollutants and new chemical contaminants, of tensions over water resources, and after a decade marked by the economic crisis, financial issues related to the proper management and renewal of water & wastewater asset appear crucial. Indeed, maintaining the value of the installed assets is key to ensure the good performance and sustainability of drinking water and sanitation services. Taking into account this context and these challenges, the French Ministry of the Environment will hold in May 2018 the "Water Conference" at the request of President Macron. This event is foreseen as a new impetus for all actors in the sector to review the financing scheme of investments related to water and wastewater assets, and to propose an innovative economic model to maintain sustainable funding for the sector over the next decades.

In order to pave the way for such innovative model, this article firstly proposes a quick review of the actual financing model of the water and wastewater sector in France. By doing so, it seeks to identify areas of potential improvement for the funding scheme of both the small and the big water cycles[2]. Finally it proposes innovative practices and schemes to ensure reliable and sustainable funding to address water-related challenges in the coming decades.

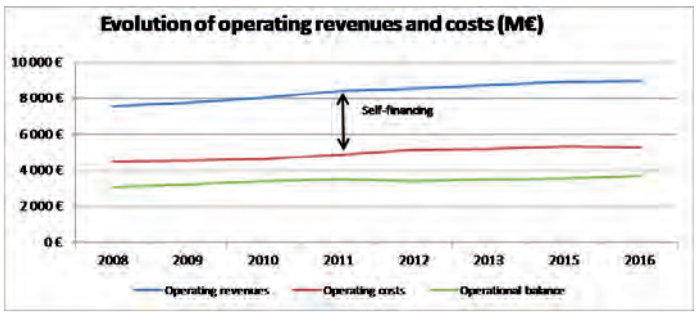
The 28,000 water and sanitation services are the main stakeholders and funders of the water economic model in France. Then come the 6 Water Agencies that provide grants to finance investments related to the small and the big water cycles. The National Office for Water and Aquatic Environments (ONEMA), which recently merged with the French Agency for Biodiversity (AFB), is in charge of inter-basin solidarity and, as such, supports the funding of investments in overseas territories and in Corsica. In addition to these funds stemming from the water and wastewater invoice, some public subsidies financed by taxes and some financial transfers from European funds are also available to fund water and wastewater related investments.

2 Small water cycle refers to water and wastewater services whereas big water cycle refers to the natural water cycle.

Public water and sanitation services: the main actors and financiers of the small water cycle

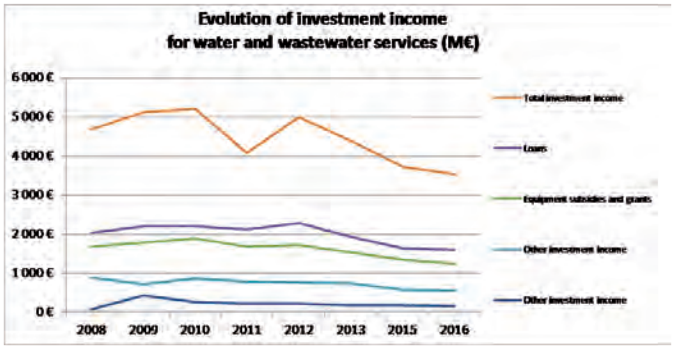
→ **The steady increase in revenues and operating expenses over the last 10 years has generated an increase in self-financing...**

The revenues and operating expenses of water and sanitation services increased respectively by 19% and 18% between 2008 and 2016. Operating revenues, which have reached € 9 billion in 2016, come for 85 % from the water and sanitation bill. The same year, operating expenses amounted to € 5.3 billion, showing a cash flow of € 3.7 billion, up 21% compared to 2008.



→ **The increase in self-financing was used to offset the decline in investment income ...**

This operating surplus, which is intended to finance investment, was used to partly offset the decline in equipment grants and subsidies, which fell by 24% between 2008 and 2016, on the one hand, and to reduce borrowing, which fell by 21% between 2008 and 2016, on the other hand. Nevertheless, despite this operating surplus, investment income steadily declined over the period to reach € 3.54 billion in 2016.



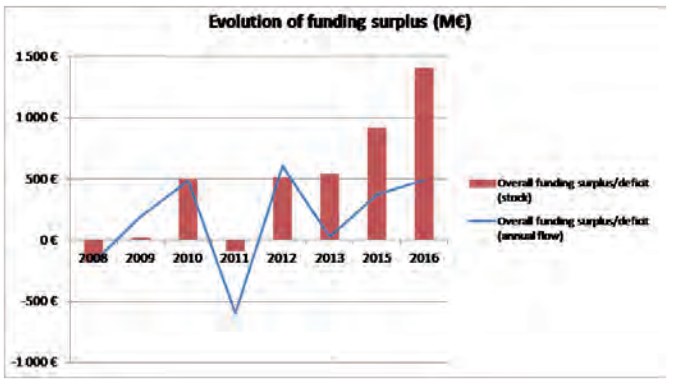
→ ... and did not stop the decline in investment

Investment expenditures, after a slight increase between 2008 and 2011, declined thereafter. In 2016, they amounted to € 6.75 billion, or 0.3% of GDP. Most of this amount (71%) was spent on direct investments and 22% was spent on loans capital repayment. Between 2008 and 2016, direct investment fell in absolute terms by 20% while loans capital repayment increased by 10%.

This decline of direct investments is due to several factors. After 2010, and due to the completion of most Urban Wastewater Treatment (UWWT) Directive compliance investments, a reduction of investment expenditure is observed. In 2014, due to the municipal elections, the public purchase and investments fell and did not regain its previous level thereafter. Finally, since 2015, the regulatory uncertainty surrounding the implementation of the law on the new territorial organization of the Republic (NOTRe) has also resulted in deferred investment projects. This observation is confirmed by the barometer of the Public Procurement Observatory (AdCF - Caisse des Dépôts, 2017) showing a decrease of 17% for water-related public purchase and of 30% for sanitation, over the period 2012-2016.

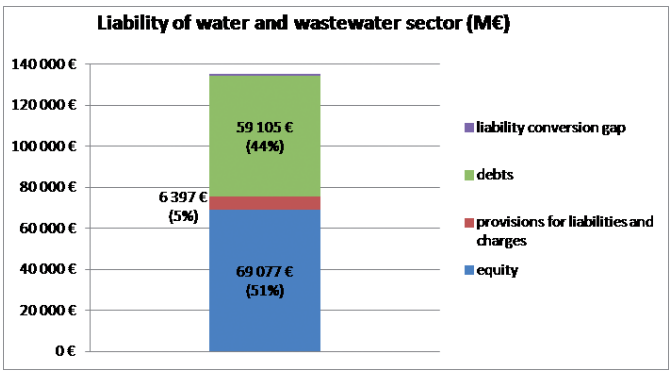
→ Cumulative funding surplus of € 1.4 bn between 2008 and 2016, and € 5 bn in asset cash

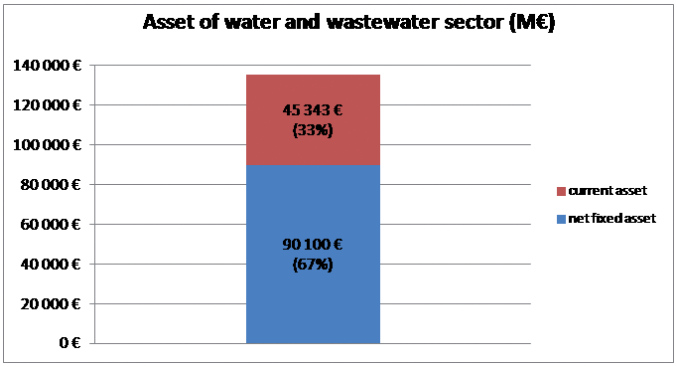
Overall, when comparing total revenues of water and sanitation services to their total expenditures, there appears a funding surplus that cumulated to a total of € 1.41 billion between 2008 and 2016.



The exploitation of National Statistical Institute (INSEE) data makes it possible to propose a balance sheet approach for the water sector. The representation of this balance sheet for the year 2015 shows a liability of a total amount of 135 billion euros, composed of 51% equity and 44% debt. The financial debts (loans and similar debts) represent 19% of the overall liability.

The asset side of the balance sheet is composed of 67% fixed assets and 33% current assets. The asset cash from services is estimated at around € 5 billion (or 11% of current assets).





→ Assets depreciate faster than they are renewed due to insufficient investments

The use of INSEE data for the water and sanitation sector also makes it possible to analyze changes in the gross and net value of the sector's assets. The gross fixed capital value of the sector represented 3.5% of GDP in 1978, and reached almost 5.3% in 2015. Over the same period, the value of net fixed capital[3] increased less rapidly, from 2.3% of GDP in 1978 to 3% in 2015. This difference can be explained by the comparative evolution of gross fixed capital formation[4] (GFCF) and consumption of fixed capital[5] (CFC). Between 1978 and 2015, the GFCF amounted to an average of € 3.7 billion, with a sharp increase since 2000 as a result of compliance investments made to reach European standards. However, the level of GFCF, which stands at 0.28% of GDP[6] in 2015 against 0.27% for the CFC, did not fully offset the depreciation of assets. Since gross assets are recorded in the balance sheet at their historical costs, GFCF must be much higher than CFC to offset their value decrease. As a result, and because of insufficient GFCF, the net value of assets has grown less rapidly than their gross value during the period. Thus, the net value of fixed capital represented 67% of its gross value in 1978, against 55% in 2015, highlighting the depreciation of as-

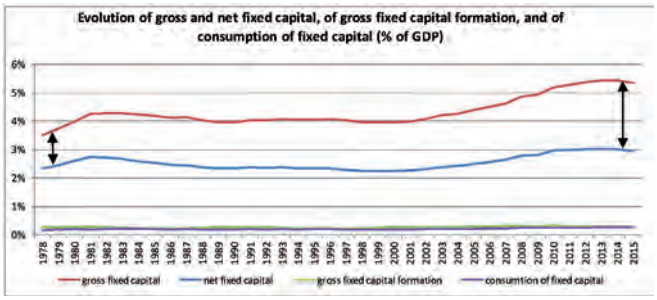
3 Net fixed capital is equal to gross fixed capital less accumulated consumption of fixed capital.

4 Gross fixed capital formation (GFCF) is the balance between acquisitions and disposals of fixed assets.

5 Consumption of fixed capital measures, for a given period, the value loss of the fixed capital stock used by a producer, due to time, physical wear, obsolescence or common accidental damage . Consumption of fixed capital is a cost of production.

6 The OECD recommendations advocate, in fact, an annual investment expenditure in the water and sanitation sector of between 0.3% and 1.2% of GDP for developed countries.

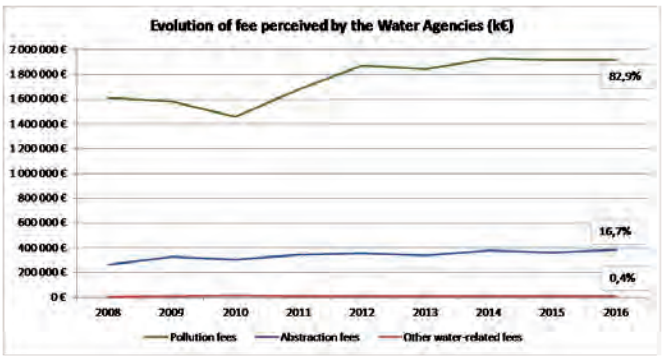
sets over the period. The larger gap between the red and the blue curve in 2015 compared to 1978, on the graph below, reflects this phenomenon.

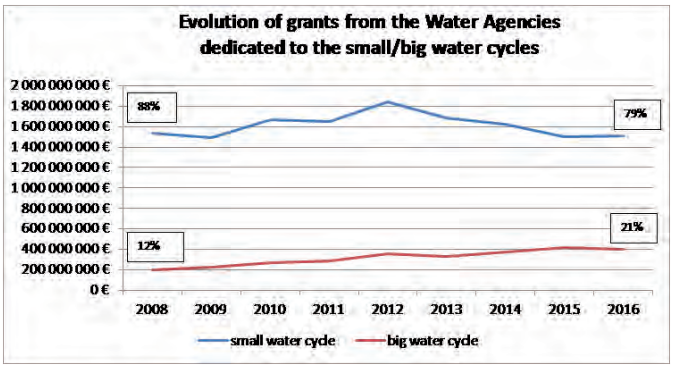


The six water agencies: pooling funding for both the small and the big water cycles

→ An increase in the fees collected by the Water Agencies...

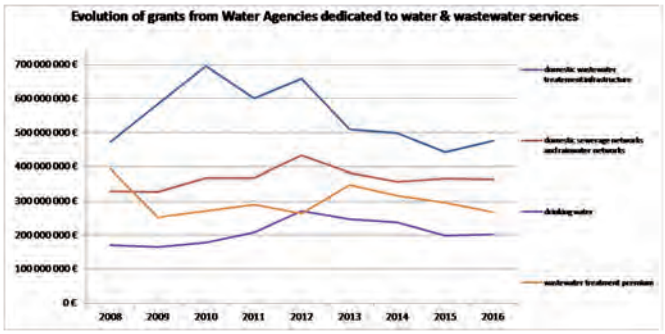
The fees collected by the Water Agencies increased from € 1.8 billion in 2008 to € 2.3 billion in 2016 (+23%).





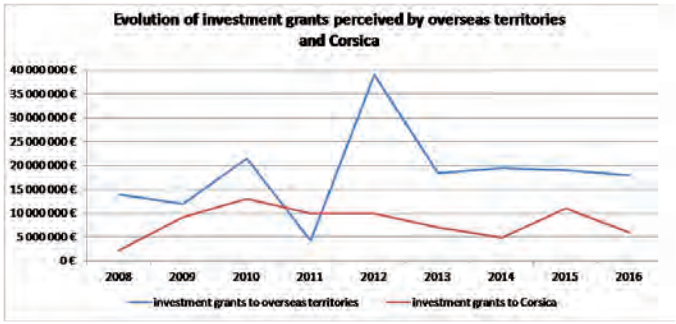
→ ... which benefited primarily to the big water cycle

The Water Agencies' grants represented € 1.7 billion in 2008 and € 1.9 billion in 2016 (+10%). However, this increase has been more beneficial to the big water cycle than to the small one. In 2008, around 88% of Water Agencies' grants were devoted to the small water cycle (€ 1.61 billion). In 2016, this proportion fell to 79% (€ 1.51 billion). The Water Agencies program dedicated to financing investments in public water and sanitation services accounted for 86% of all spending on the small water cycle in 2016, and amounted to 1308 € M, in decline of 4.4% since 2008. The reduction of grants is mainly due to the decrease in investments in wastewater treatment plants, as compliance with the UWWT Directive had been reached for the majority of the treatment plants. The Water Agencies grants dedicated to "domestic sewerage networks and rainwater networks" remained stable over the period 2008-2016, peaking in 2012, while the grants for "drinking water" increased by 18%, in particular because of investments related to the Drinking Water Directive, and for catchment protection actions as prescribed in the Grenelle Law. Grants devoted to "wastewater treatment premium" flex nearly by one third between 2008 and 2016, as some Water Agencies have decided to remove these operating grants.



Specific financial support for water and sanitation investments in French overseas territories and in Corsica

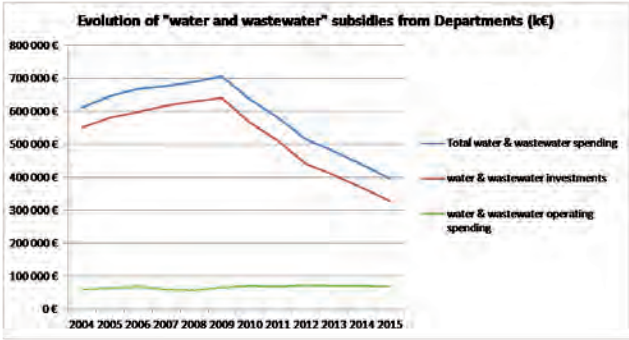
The National Office for Water and Aquatic Environments (Onema), merged within the French Agency for Biodiversity in January 2017, is in charge of inter-watersheds financial solidarity, particularly vis-à-vis French overseas territories. As such, Onema has financially supported investments for the small water cycle in overseas territories and in Corsica. Over the period 2008-2016, the average annual grant to overseas territories amounted to nearly 18.4 million €, and to about 8 million € for Corsica.



Decline of 43% in subsidies awarded by French Departments between 2008 and 2015

In addition to the funding stemming from the water and wastewater invoice, the French Departments also provide subsidies for water and sanitation investments, financed by taxpayers.

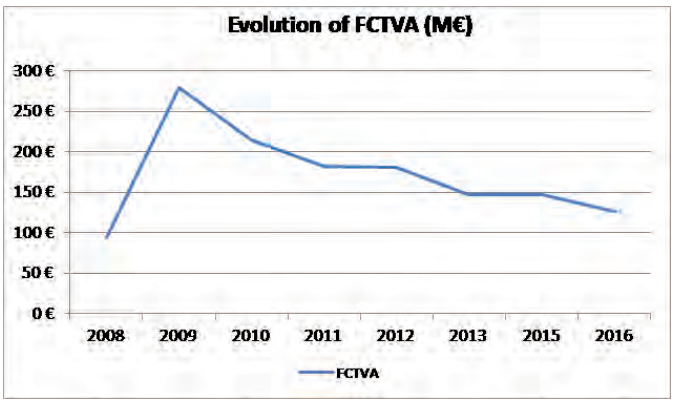
These subsidies, which amounted to more than €600 million in 2004, increased until 2009 to more than €700 million. From 2010 onwards, they fell down to reach €400 million in 2015. These subsidies mainly finance capital expenditure (on average 89% over the period 2004-2015) and secondarily operating expenses (in average 11% over the same period).



The reasons for the gradual decline of these subsidies stem from the successive reforms of the territorial organization and competences of local authorities. In 2010, a reform of French local authorities tried to clarify the powers between local authorities by removing part of the general competence clause. In January 2014, the law of modernization of territorial public action has refocused the competences of the Department on welfare and solidarity. In 2015, the NOTRe law, which applies the principle of specialization between Departments and Regions, has reduced the Departments' competencies to the benefit of Regions, while reaffirming that Departments remain the competent authority for solidarity and territorial cohesion. Thus social action has become the main mission and focus of Departments.

Declining investment leads to lower VAT compensation fund allocations since 2009

The endowments of the VAT compensation fund (FCTVA) perceived by water and wastewater services amounted to € 93 million in 2008 and € 126 million in 2016 (+35%). However, since a peak of € 280 million in 2009, the FCTVA amounts have regularly decreased until 2016, showing a decrease of 55% between 2009 and 2016. It is important to note that the FCTVA endowments are correlated with the amounts invested by the services which opted for this fund. Thus the decline of the FCTVA since 2009 is simply reflecting the overall fall in water and wastewater investments.



Low consumption of available European funds

For the period 2014-2020, the European funds allocated to France amount to about 26€ bn available through three funds (ERDF, EAFRD and EMFF). Within this envelope, approximately € 15 billion are dedicated to the support of the Water Framework Directive implementation, among other things. However, despite the availability of these funds to invest in both the small

and the bug water cycles, France has only consumed 4% of its grants from 2014 to2016 (ie € 600M in three years) against 47% for Germany for example. This low consumption of European credits can be explained by the transfer of the management of these funds from the State to the Regions. Since 2014, the Regional Council became "the managing authority" of these European funds. It is therefore responsible for the allocation these funds, and for selecting potential projects developers. This transfer of management duties required a transfer of staff which was only completed in January 2016. It also required the hiring of additional staff, which took time.

Case studies: how other European countries address their water and sanitation investment needs?

By way of comparison, the water and sanitation sectors, as well as the challenges they face, have been described in three European countries. The table below summarizes the main technical and financial data of the water sector for each country.

INDICATORS	AUSTRIA	ITALY	NETHERLANDS
Total population (M inhabitants)	8.5	60.6	17.1
Number of water services	5,465	91	10
National Regulatory Agency	no	Yes	no
Territorial reform to promote aggregation of services	no	Yes	Yes
Average water consumption (l / inhab /d)	140	241	129
Non revenue water (%)	16	39	6
Length of water network (km)	76.700	337459	119339
Length of wastewater network (km)	96.200	164473	ND
Average price including taxes (€ / m3)	3.25	1.43	4.57
Investment needs (per year)	€ 772 million	€ 2.2 billion	€ 5.34 billion*
Effective investments (per year)	€ 619 million	€ 1.1 billion	€ 4.47 billion *
Effective investments (% of GDP)	0.15	0.07	0.64
Share of service financing from invoice (%)	87	ND	94
Use of European funding for investments	no	Yes	Yes
Use of public subsidies for investments	Yes	Yes	Yes
* This amount includes operating and investment expenses.			

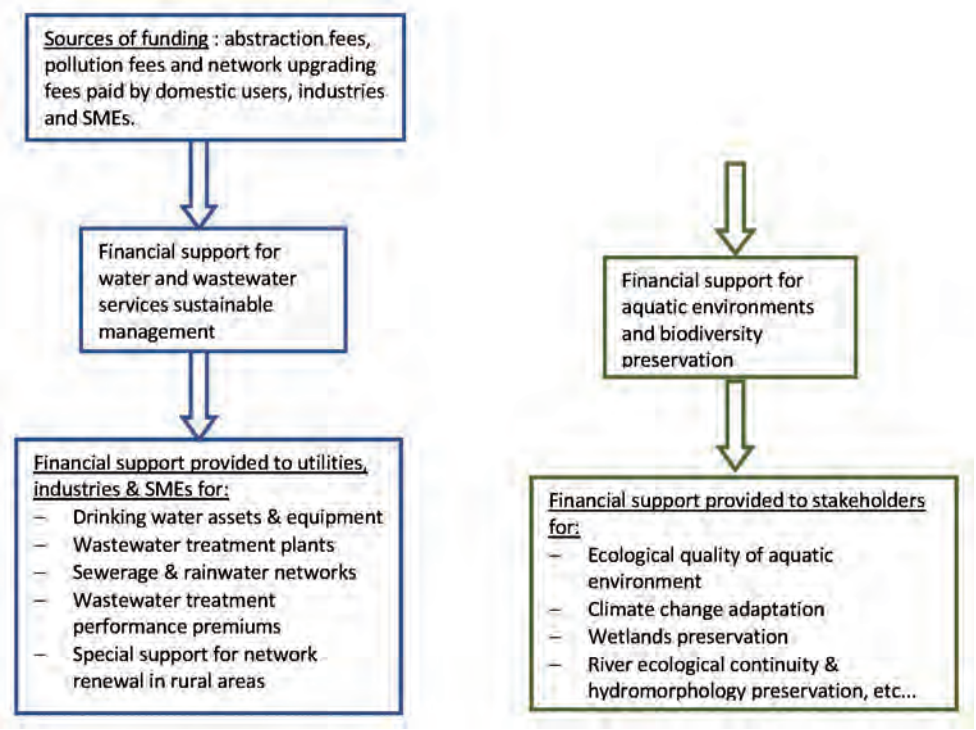
This comparative analysis shows that, in each country, there exists a differential between investment needs on the one hand and investments actually made on the other. This difference amounts to 24% in the case of Austria and 50% for Italy. The differential estimated for the Netherlands takes into account all financing needs (operating and investment) compared to all current expenditures. It amounts to about 20% for the small cycle and would range between 25% and 36% for all the small and big water cycles. In addition, Austria and the Netherlands display high cost recovery ratios (87% and almost 100%) due to a good implementation of „water pays for water" principle. These high ratios make it possible, inter alia, to explain that the difference between investment needs and investments made is limited to 25% in these two countries. On the other hand, in Italy, where the price of water is low and, as a result, the cost recovery ratio is low, the difference between investment needs and investments made is twice as great. The Italian regulator of the water sector is gradually remedying to this situation by introducing a price setting method which includes components intended to take into account the financing of new investments, the renewal of existing infrastructures, the coverage of operating costs and environmental costs. In these three countries, public subsidies (financed by taxpayers) are granted, to varying degrees, to finance investments in water and sanitation. In Austria, these subsidies, coming from the national budget and local budgets, represent 32.5% of overall funding allocated to investments in the water and sanitation sector. In the Netherlands, subsidies from the national budget account for 6.5% of the funding allocated to the water sector and sanitation. In Italy, these subsidies are expected to represent about 9% of investment financing over the next 25 years.

Building upon the results of this quick overview of the actual funding model of the French water sector the following improvement proposals can be formulated to secure sustainable, reliable and sufficient funding for upcoming water-related challenges.

→ **Improve utilities asset management policy and tools**

The quick overview of the financial model of water and sanitation services in France shows that utilities have not been able to offset the depreciation of their assets in the past decades, despite an increasing self-financing capacity. In order to remedy this situation, water and wastewater services should implement a sound and robust asset management policy which is presently lacking. To do so and thus to help services manage (and renew) their assets, a series of asset management accounting ratios are proposed to be made compulsory. By using these tools, services managers will gain knowledge and understanding with regard to asset management, and will have concrete elements to steer the asset policy of their utilities. This proposal is intended to help counter the actual fixed capital depreciation which has been underlined in the quick review. Here are some examples of possible asset management ratios:

- Self-financing rate of direct investments
  (Ratio between net saving and direct investment)
- Equipment ratio
  (Ratio between direct investment expenditure and operating revenues)
- Infrastructure usage ratio
  (Ratio between the net value of fixed capital and the gross value of fixed capital)
- Financial debt ratio(Ratio between financial debts and equity)



→ **Set up two differentiated funding schemes to secure financing for the small water cycle on the one hand, and for the big water cycle on the other hand**

The stakes and challenges that water stakeholders have to address take many forms. Water and wastewater services will have to renew and maintain the value of their assets[7], to set up treatment to tackle new chemical contaminants, to manage water scarcity, etc… Water stakeholders will have to improve and/or preserve the ecological quality of aquatic environments, to restore and/or preserve ecological services provided by ecosystems, to ensure ecological continuity of rivers, etc… These challenges concern both the small and the big water cycles as they are interlinked in the natural environment. However, in order to secure sufficient and sustainable funding for both water cycles, it is propose to set up two different and separated funding schemes: one specifically dedicated to support water and sanitation services sustainable management, and one dedicated to aquatic environment and biodiversity preservation. The graph below sums up the proposed sources of funding for each financial scheme, as well as the areas covered by both schemes.

The challenges faced by water and wastewater services (asset renewal, treatment of emerging pollutants…) require important investments and funding over time . These challenges are deemed to be more problematic in rural areas where the density of water consumers per network km is lower and consequently service revenues less important. Hence it appears crucial to secure funding specifically dedicated to support asset management policies in rural areas (as specified in the graph above). This can be done by implementing solidarity mechanisms between urban and rural areas, as this is already the case through the Water Agencies funding mechanisms.

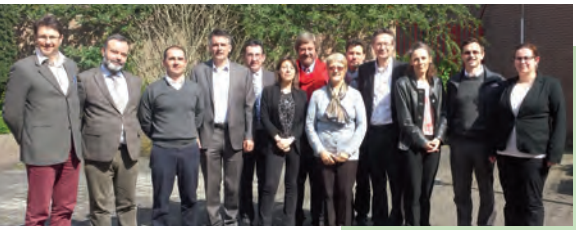
As a suggestion, and in order to make use as much as possible of the existing institutional bodies, it is proposed that the Water Agencies act as the key bodies in charge of the financial support scheme dedicated to water and sanitation services while the French Agency for biodiversity would act as the key body dedicated to aquatic environment and biodiversity preservation.

→ **Set up an environmental fee based on the "extended producer responsibility" principle to fund actions with regard to the big water cycle**

Among the environmental fees mentioned in the graph above to fund the big water cycle, it is proposed to create a new fee based on the "Extended Producer Responsibility" (EPR) principle which is embedded in French legislation since 1975. EPR uses financial incentives to encourage manufacturers to design environmentally friendly products by holding producers responsible for the costs of managing their products at end of life. This principle could be applied to firms producing products (plastic incorporating nano-particles, new chemical substances, micro-pollutants in cosmetics and medicines etc…) that pollute water and that require costly treatment to ensure aquatic environment preservation. Environmental fees could be perceived from these producers to fund the French Agency for Biodiversity, and thus generate revenues to fund financial support for big water cycle actions. These newly created environmental fees would act as a way to internalize negative environmental externalities, hopefully helping to reduce pollution emission in the future.

The "Water Conference" in May 2018 in Paris will bring the opportunity to discuss further these proposals with all stakeholders, and hopefully pave the way for an innovative financial model for water policy in France.

7 See our study on water and wastewater asset renewal challenges in France.



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Policies, Innovation and Networks for Enhancing Opportunities for China-Europe Water Cooperation: The PIANO project

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Abstract: PIANO has been a comprehensive and structured framework to identify European TWIs that have a potential for application in China. It further highlighted some of the key drivers as well as barriers for European companies that want to expand to the Chinese market and concluded with policy recommendations and a strategic research and innovation agenda between Eu and China water cooperation for mutual benefits.

1. Introduction

The many water challenges of China have been well documented (e.g. Starkl et al., 2014, CEWP 2014). Population growth and rapid development of the Chinese economy have increased demand for water and put water resources under immense pressure. In dry Northern and Western China, water scarcity has left rivers dry and caused the rapid declining of groundwater tables (Zheng et al., 2010). Insufficient wastewater treatment capacity to clean the growing amount of wastewater, diffuse pollution from farmlands and uncontrolled discharges from industries have left surface water bodies heavily polluted with nutrients, organic chemicals and heavy metals (Liu et al., 2011). Floods have historically impacted China greatly and while many of the major rivers are now controlled with larger hydro-electric dams, extreme events and unregulated small and medium tributaries continue to pose flood risks (State Council of the PRC, 2010).

In response to these pressures, China's water policies have substantially changed over the last 6 years. An overview can be seen in Starkl et al. (2017). Thus, the policy framework is driving a need for massive investment in water and environmental improvements that will be supplied primarily through the PPP projects, to be delivered by consortia of public and private companies together with a vast number of sub-contracted suppliers of technology and equipment. Since many traditional water technologies may have reached and/or exceeded the limit of sustainable water provision, an opportunity exists for innovative (and integrated) solutions capable of addressing environmental concerns (Moro et al., 2018) which return better value to the projects and are in line with recent policy development thereby resulting in higher returns and greater success. The 2011 Number 1 Policy document on water reform takes as its fifth principle the promotion of innovation in water infrastructure provision. Consequently, there is now significant demand for innovative water management technologies across China and mechanisms to drive innovation in the local market. The challenge to European innovators is how to access and succeed in this market.

The project PIANO (Policies, Innovation and Networks for enhancing Opportunities for China Europe Water Cooperation) has endeavoured to explore the potential for innovative water technologies offered by Europe for implementation and upscaling in China. It started with a landscaping of technological water innovations (TWI) in Europe and China, and then shortlisted TWIs with a potential for application and replication in China. As a next step, barriers for their implementation were identified, and drivers and strategies that could help to overcome such barriers were discussed. The results from these steps could then lead to the identification of areas for joint development of technological solutions, as part of a strategic research and innovation agenda between Europe and China.

2. Landscaping of technical water innovations

The PIANO project first conducted a comprehensive landscaping – mapping, scoring and ranking – of European and Chinese TWIs to identify and prioritize innovative water technologies in Europe with potential for application in China. The landscaping was conducted across the following 5 water sectors: agricultural water management, municipal water management, industrial water management, river basin management and water for energy. In PIANO, the TWIs investigated encompass products and processes that modify, optimize, support, are part of, or constitute entirely new treatment technologies, water use technologies, water production technologies, water management technologies, and technologies for flood protection or energy production. These TWIs can be innovative by themsel-

ves or can constitute a part of an innovation process. Based on this landscaping, the identified TWIs were than assigned to one of the following 5 categories:

Category 1 - established (conventional) technology solutions available in both the EU and China,

Category 2 - established technology solutions available in Europe, but not in China,

Category 3 - similar/joint innovative solutions available in both the EU and China,

Category 4 - innovative solutions available in Europe but not China,

Category 5 - innovative solutions available in China but not the EU

As the focus of PIANO is on innovative solutions, the TWIs identified in categories (3) and especially (4) were of most interest. Data has only partially been provided from China, limiting the analyses possible on the Chinese aspects. Moreover, although special focus was on developing the landscaping methodology, it should ideally be undertaken as an iterative process with repetitions of mapping, scoring and cross-checking by external experts in both regions. The method of obtaining the TWIs was through academic networks and as such has tended to target products that are spin offs from research rather than a reflection of what EU SME's are producing for water sector export markets. Nevertheless, it has been possible to undertake a comparison of water innovation performance in a Europe-China context to a quite high degree considering the lack of knowledge regarding which technologies are used and/or under development in China. In the scoring survey, experts in Europe and China were asked to determine for each TWI – among other assessments – the degree of European technological leadership and of novelty to China, indicative for the relative innovative performance of the two regions. The resulting inventories (ranked TWIs) plus leadership assessments thus serve as an indicator of the strength and scope for technological development in a specific sector. Table 1 presents the full inventory containing up to 20 European TWIs per sector (shortlisted from a total survey of over 200 TWIs).

Table 1: Overview of TWI numbers in Inventory I for each sector.

Sector	Category					Total
	1	2	3	4	5	
Agricultural water management	-	-	15	5	-	20
Municipal water management	2	-	14	15	-	31
Industrial water management	-	-	18	11	-	29
River basin management	-	-	6	12	-	18
Water for energy	-	-	5	13	-	18
Total	2	0	58	56		116

Inventory II is the targeted inventory containing sector-specific category 4 European TWIs (see Table 1). These are considered to have the highest potential for implementation in helping to resolve relevant water challenges in China. In total around 100 European technologies were identified, with 59 belonging to category 4. Hence, Europe offers a number of innovative technologies with a potential for application in China. These technologies encompass the following types:

- Monitoring: Tools that gather data on the state of the environment, infrastructure and processes.
- Modelling/DSS: Tools that interpret monitoring data and integrate with scientific understanding of the behaviour of systems over time to inform decisions on the design and operation of infrastructure and equipment.
- Integrated management systems/controls: Tools that convey the conclusions from the modelling and DSS systems to the infrastructure – communications (e.g. SCADA) and automation (e.g. actuated valves, speed controllers etc).
- Products/Processes: Actual infrastructure and equipment. Either physical structures or process designs.

The collection of TWI's through Academic networks has yielded a high number of innovations in the monitoring, modelling, and control systems areas and fewer in product categories. This may be compared with similar exercises conducted under the EU-Gateway programme in 2018, which yielded most solutions in the product and process category

3. Drivers and identified technical water innovations

The following drivers and technical water innovations were identified.

Agricultural sector

Agriculture in China is moving to a more intensive mode of production, especially in areas closer to cities. There is the need to attain higher yields and optimise inputs of water and nutrients to minimise waste and negative environmental impacts, while ensuring adequate food supply (Kahrl et al., 2010). There is a widespread over exploitation of water resources, especially groundwater, and a need to increase recharge of available aquifers and to protect these resources against subsidence and pollution. There is also the need to integrate the increasingly intensive farming methods into the needs of developing a sustainable water resources, water quality and soil management system. Table 2 outlines the European TWIs that were identified under category 4.

Table 2: Category 4 TWIs for Agricultural Water

Area / Type	Monitoring	Modelling / DSS	Control systems	Products
Irrigation and Nutrients		A8, A16, A24, A30	A24	
Surface and groundwater water pollution	A36	A36		
Reduction in groundwater overdraft	A16	A16		

Description: A8: SCADA remote control system, based on the qualitative parameters of treated water to be used for irrigation

purpose; A16: Multi-sensory platforms for improving irrigation water use efficiency by managing spatial and temporal variability. Ground based soil and plant sensors (geophysical sensors -EMI, GPR-, passive hyperspectral sensor and active radiometric sensor connected to a DGPS); A24: Integrated water management system for forestry in arid lands. Coupling of phytotechnologies with wastewater treatment, land recovery with multipurpose forestry; A30: Software for nitrogen budgeting for each crop based on estimates of crop demand and nitrogen availability from various fertilizers; A36: Groundwater sampling system with passive samplers measuring volatile organic compounds.

Municipal sector

Urbanisation and economic development has driven investment in urban water systems. There are specific targets in the 13th Five Year Plan for water consumption and water quality. Most significantly, the plan aims to reduce water consumption by 23% from 2015 levels by 2020. China will also develop and upgrade urban sewage facilities. Water quality is targeted to improve through 2% reductions in chemical oxygen demand and ammonia nitrogen emissions each year. Wastewater treatment rates are set to increase to 95% in urban areas and 85% in non-urban counties. They are also set to have more regions applying the highest levels of tertiary treatment and production of wastewater suitable to be directly recycled or re-used. This represents a significant increase in the quality and standard of wastewater treatment in Urban areas and the extension of basic treatment to more rural areas. Table 3 outlines the European TWIs that were identified under category 4.

Table 3: Category 4 TWIs for Municipal Water

Area / Type	Monitoring	Modelling/ DSS	Control systems	Products
Water treatment systems	B50, C1			B47, B59
Water networks		D10, D11, B62	B62	
Desalination and water recycling				B39
Wastewater treatment	B52	D13	B41, D13	B20, B48, B54, B59
Sludge management				B37, B64
Sponge Cities				B20, B47

Description: B50-Coliform monitoring technology; C1-Optical biosensor; B47-Combination of coagulation and direct filtration for surface water treatment; B59-Catadox advanced oxidation process; D10-Acustic leak detection data logger; D11-Water Optimization for Network Efficiency (WONE); B62-DSS for urban water distribution networks; B39-Desalination using salinity gradient power; B52-UV-VIS multiparameter sensor; D13-Smart tool for multiple data integration for wastewater management operation; B41-Mobile smart floating sensor for wastewater treatment plants; B20- ACT Natural processes (biofiltration) based wastewater treatment; B48-Packaged wastewater treatment plant; B54-UV disinfection systems to treat effluent from fish farms; B37-Cannibal sludge treatment process; B64-Hydrothermal sludge carbonisation

Industrial sector

The management and treatment of industrial wastewater is the main focus of „The Action Plan for Prevention and Treatment of Water Pollution" released in 2015. Further, for industry a main driver are the tighter Environmental Protection Law (EPL) which came into effect 1 January 2015. EPL instigates increased transparency and monitoring while rewarding compliant enterprises and companies in the environmental protection industries with financial incentives such as tax breaks, non-compliant enterprises will face heavy penalties such as shutdown. Table 4 outlines the European TWIs that were identified under category 4.

Table 4: Category 4 TWIs for Industrial Water Management

Area / Type	Monitoring	Products/Processes
Clean water production	C58, C62	
Water reuse, recycle and recovery systems	C58, C62	C53, C59
Wastewater collection, treatment and disposal	C62	C6, C11, C13, C15, C29, C31, C53, C60

Description: C58- Optical laser real time monitoring system for contamination detection in water. C62-Surface Sensor for online, real time monitoring of the fouling tendency in the water circuits; C53-Forward Oxidation; C59-Combination of UV and chemical oxidation for water disinfection; C13- Air/water cleaning process to control membrane fouling; C15- Membrane distillation using (waste) heat; C29- Dynamic vapour recompression to concentrate salt and carbonate rich liquids; C31-Spiral Plate Technology for separation or clarification in wastewater treatment; C-60 Advanced oxidation technology combining the advantages of adsorption and oxidation within a single unit; C6-High Rate Anaerobic Reactors for treatment of high BSB/CSB loads; C11-Hybrid aerated activated carbon filtration for industrial wastewater treatment;

River basin management

The river basin management sector is led mostly by local government departments, the main drivers are national policies for water resource management, water quality protection and flood management. Local government officials are responsible for meeting targets on water resource management and water quality as a part of their official performance reviews. This motivates them to find solutions at a local level that will help meet these objectives. Though this can motivate to solve problems at source with urban and industrial wastewater treatment, because an official is responsible for the water that is passing through their area they are also motivated to put in place in river treatment solutions that would not be seen elsewhere in the world. Rivers passing through urban areas are also major focusses for redevelopment as attractive features leading to increasing property values – to achieve this extensive river restoration is required.

Solutions, such as river monitoring networks, need to integrate over regions and there is a strong preference for locally sourced solutions. Other areas such as flood control embank-

ments, dams, irrigation channels, river training works and inter-basin transfers are very large investments but most of this is relatively low-tech earth moving and construction which is difficult to access as a foreign company. Thus, it is in the development of modelling and decision support systems that the bulk of innovations are focussed. These are the areas where foreign expertise is able to add most value by the optimisation of investment plans that will meet the performance indicators. Table 5 outlines the European TWIs that were identified under category 4.

Table 5: Category 4 TWIs for River Basin Management

Area / Type	Monitoring	Modelling/ DSS	Control systems	Products
Flood Management	D1	D15		D2, D5, D16, D24
Integrated river basin/water resources management tools		D15, D22, D23		D21
Water quality management	D8, D9, E14	D15		

Description: D5-Floating technology for water retention and flood resilience; D1-River basin including flood risk management using space-based technology and information and communication technology; D15-Natural water retention measures with crowdsource DSS; D2-Smart dikes using innovative materials and real time sensors; D16-Bio-inspired dams for ecosystem degradation management; D24-temporary (mobile) flood proofing barriers; D22-Stochastic analysis for long-term water management in data-poor areas; D23-Integrated water resources management DSS combing hydrological, river basin management and groundwater models; D21-Computer games for educating sustainable water resources management; D8-Web mobile application to report river water quality status for citizens; D9-Microalgae based on-line sensor for detecting priority pollutants in sewage effluents; E14-Smart bouy to monitor in-situ water quality coupled with web platform

Water for energy

„Hydropower Thirteenth Five Year Plan", released in November 2016, proposed that future hydropower development should follow the principle that hydropower development should be prioritised in the mainstream areas while environmental and ecological protection should be prioritised in tributary areas. Hydropower development in small and medium-sized watersheds should be strictly controlled to retain the essential habitat and ecological health in those watersheds. The Plan also points out, during the 13th Fiver-Year period, water to energy sector would need an investment of approximately RMB 500 billion, in which large and medium-sized conventional hydropower stations account for about RMB 350 billion, about RMB 50 billion for small hydropower stations, and about RMB100 billion for pumped storage power station. Table 6 outlines the European TWIs that were identified under category 4.

Table 6: Category 4 TWIs for Water for Energy

Area / Type	Monitoring	Modelling/ DSS	Control systems	Products
Small scale hydropower		E9, E15, E17		E1, E3, E4, E5, E6, E23
Reserving natural ecosystems-minimise impact from hydropower on environment				E12, E13
Novel energy production systems				E19, E20

Description: E9-Hydropower plant simulator for simulating refurbishment and maintenance decisions; E15- Earthquake safety assessment for concrete dams foundation failure by application of numerical tools; E17-Integrated assessment and structural modelling of swelling processes in concrete dams: measurement of concrete stress using flat jacks and over-scoring techniques; E1-Hooped pelton turbine; E3-Screw turbine for small hydro power systems; E4- Vertical micro pelton turbine with composite runner buckets in package type generating unit for small rivers; E5-Very low head turbine generator (Kaplan type); E6- Small turbines to be retrofitted in small-head existing structures; E23-Micro hydro-power system; E12- Behavioral fish barrier (using a strobe light, sound and a bubble curtain as stimuli) to divert fish e.g. from turbine blades; E13-Water lubricated bearings as environmental friendly alternative to oil lubricated installations; E19- Geothermal energy pump to harvest geothermal energy; E20-Wave power device based on oscillating water columns, to generate electricity from waves;

4. Barriers to water innovations in China

General barriers

An initial survey has shown several barriers to water innovation in China (Starkl et al., 2017). The following text briefly outlines specific barriers for the examined sectors:

Specific/additional barriers to agricultural water management

With respect to the 5 European TWIs for agriculture these will face all of the general barriers identified above. In addition, they will face specific barriers such as:

- Public acceptance of the direct use of recycled water in irrigation.
- Cost of infrastructure of conveyance of recycled water to irrigation systems
- Reliability of supply of recycled water
- Undeveloped regulatory framework for the recycled water – standards and protocols for what to do with rejected water

Specific/additional barriers to municipal water management

The core aspects of Water supply and wastewater management are well understood and established in China, only in niche and specialised areas can EU companies stand out. Estab-

lished SOE / Private sector companies are now fully established in the core Urban water and wastewater treatment and supply markets. There is now little scope for EU business to directly engage in the main urban water business or to bid successfully against local players. As for the agricultural water section monitoring, modelling and design of control systems remains an area of opportunity and faces the same barriers as listed there. The integration of Green infrastructure into urban planning and design was pioneered in Europe and is now being implemented on a massive scale in China.

Specific/additional barriers to river basin management

Despite significant rises recently water resources fees are at a fairly low level and collection not always enforced, as a result the water resources management sector is dependent on government subsidised projects. This can make market access difficult for private and foreign companies. The dams sector is now very mature in China with little further to add from foreign experts. The earth moving and construction activities of major national projects are generally closed to foreign contractors. For modelling and decision support systems, though there is demand for products there is not a lot of money available to pay for them and copying and IPR loss is a high risk. Thus strategic partnerships with Government institutes will be required to access most of these markets and to gain acceptance of products.

Specific/additional barriers to water for energy

This sector is dominated by major hydropower dams and increasingly by micro hydro and run of the river schemes. This is a mature industry in China where more and bigger dams are constructed than anywhere else. Having worked in the past with international hydropower experts, local Chinese producers are now able to meet most of the market needs. There is demand and interest in water energy nexus area – especially recovery of heat and electrical energy from water systems.

5. Overcoming barriers

As the previous sections have shown, there are strong drivers for innovative water technologies in China, and Europe has to offer a number of technologies with a potential for application in China. However, a foreign SME (or company) cannot easily contact and sell products to Chinese clients who would have the capacity to buy and implement their technology. A good local partner is required which in practice may be difficult to achieve.

The two main strategies for partnering for foreign SMEs are either finding distributors for direct sales and support or finding strategic partners who are involved in the PPP infrastructure projects and will incorporate the European technology to these projects. Distributors tend to be geographically based, therefore a foreign company may need to strike agreements with several different companies across China. A good route to finding distributor partners are trade fairs. Ideally the distributor should be able to provide installation, support and maintenance services as well as sales.

The policy driven solutions will most likely be implemented through demonstrations and pilots at local and regional levels delivered to local government tenders by PPP contractors. The foreign SME therefore needs to identify companies who are involved in tendering for these projects and demonstrate to them, that a consortium bid that incorporates their technology would be able to deliver better value and is more likely to win. Their role would most likely be as a sub-contractor to a consortium partner or possibly a JV partner. Certain central government agencies can be helpful in making such contacts. Innovation promotion centers in the EU and Member state missions can also help as can member states water partnerships and networks.

For innovative technologies that will challenge standards or require integration of different departments and industries the foreign company may want to also build close relations with relevant Government research or technical institutes. These often play an advisory role to government and can introduce the innovations to policy makers, planners and those preparing procurement programmes. It may be necessary to get high level acceptance of the innovation before it will be possible to move to actual sales.

Before fully engaging with any partners the foreign SME should take action to register any intellectual property in China, in accordance with guidance from the EU IPR helpdesk. Even if registered internationally IP and trademarks should be separately filed in China. The foreign SME will need to identify the situations in which their product or service may be applied and prepare the case of how it will add value. They should also research the local standards for water, wastewater and recycled water quality, or for groundwater as appropriate to ensure that they are able to operate to the appropriate standards. Targeting the appropriate partners would also mean targeting the areas of China where their particular solution will have greatest application depending on the climate and development levels. This may also affect the practicality of engaging exclusively with one partner or having to negotiate multiple relationships in different regions.

When engaging with potential commercial partners consideration will need to be given to the localization of the technology to meet local standards and documentation in Chinese. Local universities and institutes may also be able to help with this. Most important will be to understand what the contracting situations are that the foreign SME and their local partner would be targeting and how they are to prepare the joint proposals.

In all cases the provider of the technology must be able to demonstrate the business case for customers to adopt their solution rather than the status quo or cheaper local alternatives by quantifying the added value provided either through innovation or quality, reliability, and efficiency.

6. Key policy messages

Consider water as a formal component of future EU-China RIA agenda

There is significant existing scientific cooperation in the field of water, through the China Europe Water Platform (CEWP). Potential focus on the domain areas outlined in the PIANO SRIA should be considered, as it is based upon mutual challenge areas in China and Europe that are also aligned with priorities set out in existing European and Chinese SRIAs.

Better exploit existing RIA infrastructure

This can be built through existing support mechanisms for EU-China cooperation on water and integration into other EU-China collaboration platforms, such as the multi-actor partnership programs financed by the European Partnership Instrument in connection with the EU-China Water Platform, but also including DragonSTAR, ASEM Water and the EU-China SME Center EU Gateway to China: Environmental and Water Technologies; and EURAXESS (among others).. Improving links to other major flagship EU-China SRIA initiatives relevant to water innovation should also be a priority. The dialogues on food, agriculture and bioeconomy as well as on environment, climate and sustainable urbanization are potentially most relevant.

Coordinate EU water innovation support systems with Chinese counterparts

There are several existing hubs in China to support procurement of water technology solutions from Europe and internationally. Generally, these are fragmented and face challenges to properly sort/ access sufficient information on which technological solutions exist, their quality, and their fit to local conditions. Increased focus on match-making led at city or province level may hold greater opportunities than the national hubs solely led by Chinese government authorities.

Align visions with the Global Goals, and consider future collaborations on global water innovation challenges

Europe and China represent two largest markets and RIA investors in water in the world, should focus on developing innovation and uptake of innovations that can address global and development challenges beyond their markets. A proposed PIANO Strategic Research and Innovation Agenda works to this end, by aligning mutual innovation challenge areas with relevant SDG targets they contribute to.

7. Conclusions

PIANO has been a comprehensive and structured framework to identify European TWIs that have a potential for application in China. A number of European technical water innovations with a potential in China were identified. However, it has also shown that several barriers, mainly market related ones, were identified that have to be overcome by European companies to be successful in China. The project has elaborated some suggestions on how the barriers can be overcome to fully utilize the strong drivers for innovation in China and several policy recommendations have been elaborated. Further, PIANO has drafted a strategic research and innovation agenda to further deepen China Europe water research and innovation cooperation

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Climate Change and Water Resources: Call for Smart Climate Adaptation Strategies and Innovations

Cities are becoming increasingly vulnerable to flooding because of rapid urbanization, installation of complex infrastructure, and changes in the precipitation patterns caused by anthropogenic climate change. This is partly because of decreasing volumetric rainfall trends in the dry seasons in many parts of the world, which might have severe effects on reservoir yields and operational practices. In addition, more frequent and more severe intensity rainfall events can cause substantial urban inundation problems. In the Flanders area of Belgium, for instance, severe pluvial floods happened in spring 2016 and caused a total damage of 300 106 €. Rainfall intensities were at some locations up to 85 mm in 1 hour, which is twice that high than the highest intensity observed at that time scale during the last 100 years at the main station of the Royal Meteorological Institute of Belgium at Uccle, Brussels. One year later, in spring 2017, the same region was affected by a prolonged period of severe drought; the governor of Western-Flanders even decided to forbid surface water abstractions for a period of several weeks.

Such events are expected to occur more frequently in many cities in the world. Future projections of climate change impacts on precipitation, temperature and evaporation show significant increases in the temporal variability of water availability, with longer dry spells and increased extreme short-duration rainfall intensities. This leads to significant increases in the frequency of both water shortage and sewer surcharge, flooding and overflow spills. At the same time, due to the difficulties and uncertainties in climate change impact modelling and analysis on the urban scales, caution must be exercised when interpreting climate change scenarios. These uncertainties can, however, not be used as an argument for not taking determined actions. Instead, uncertainties should be accounted for and flexible and sustainable solutions aimed at.

Interestingly, climate change serves as a driver for changes in the water management and engineering paradigm. An adaptive approach has to be established that both provides inherent flexibility and reversibility and also avoids closing off options. Also co-optimizing urban drainage infrastructure with other objectives as well as active learning and involvement will become ever more important to keep our cities liveable in the future. This involves different types of solutions ranging from smart technology, robust infrastructure, well-thought (multifunctional, creative) use of available space, and other types of innovations improving the climate-driven and water system related disaster resilience. Also measures that have an impact on the population behaviour (by sensitization, e.g. increasing the self-coping capacity op people, and leading to shared responsibilities) are important. In this way, the challenges can be turned into opportunities.

Examples of ongoing projects, in which the author is actively involved, focus on these increasing challenges and opportunities for cities to cope with the climate change and urbanization trends:

- The EU-H2020 project BRIGAID (2016-2020; http://brigaid.eu/) aims to BRIdge the GAp for Innovations in Disaster resilience. The project focuses on the innovations that increase EU societies' resilience against floods, droughts and extreme weather conditions. The author is work package leader for extreme weather related innovations, e.g. innovations that reduce the risk of urban flooding. The project will make an inventory of the innovations, will conduct or support testing of the innovations for their technical performance (in the laboratory or through real field implementation or through model simulations) and social readiness. Also a market analysis will be conducted and – after successful testing – support is given to the setup of a business plan and a promotion strategy. Priority is given to nature based solutions. Innovators who have interest to participate can announce their interest by sending an e-mail to: climate-innovation@brigaid.eu.

- One of the innovations being tested in an "intelligent green-roof", where the roof storage is regulated and optimized in real-time taking rainfall forecasts into account. Using the tools Sirio and SCAN (https://www.sumaqua.be/sirio), results are upscaled for impact analysis at the scale of the entire city district. By means of smart real-time regulation of rainwater storages, the resilience of cities to cope with both droughts and pluvial floods can be strongly increased.
- The EU-H2020 project Climate-fit.city (2017-2020; http://climate-fit.city/; Greening the Economy – Innovation Action) aims to develop a Pan-European Urban Climate Service, which is a service for climate change information reg. changes in extreme rainfall and heat stress in cities. Urban flooding and emergency planning is one of the applications, for which the service will be tested. Several European cities do participate including Antwerp, .
- The ERA-NET Cofund project FloodCitiSense on "Smart Urban Futures" focuses on pluvial flood early warning, making use of crowd sourcing data on urban rainfall (low cost sensors such as rain drop sensors and amateur rain gauges) and urban flood observations, supported by apps (citizen science concept). The goal is to have a co-creation of an innovative public service for and by citizens and city authorities in an urban living lab context with all actors.
- The project PLURISK for the Belgian Science Policy deals with forecasting and management of extreme rainfall induced risks in the urban environment. It develops methodologies and software (STEPS-BE) for short-term forecasting (nowcasting) of fine-scale extreme rainfall, two-dimensional fine-scale modelling, mapping and nowcasting of inundations in urban areas, socio-economic urban flood risk quantification, urban flood risk communication and warning, and new sustainable urban flood management strategies (green - blue water; landscape architecture; ecotechnologies). The project focuses on selected Belgian cities and aims to support local authorities, which typically have low capacity in setting up risk quantification, forecasting, control and management systems.

Bjørn Jensen

Bjørn Kaare Jensen is currently the EWA Vice President. He joined the EWA Management Committee, as well as the EWA European Committee in 2014 . He is currently also a Member of the Steering Group. MEM2BIO for the. Danish Innovation Fund, as well as a Member of the Advisory Board for the UAE Water Aid Foundation (Suqia). Alongside of his functions as a national expert, member of the Programme Committee. Societal Challenge 5, Horizon 2020 and an alternate to the governor at the World Water Council, he is a member of the Steering Group of Geoscience Hall. He is currently working at the GEUS, the Geological Survey of Denmark and Greenland, where he was the Deputy Director General.

How to Expand Water Business Beyond Europe

– The need for facilitators and new financial instruments to support European innovation and export

Think global, act local? Most innovative water technologies or solutions invented nowadays are born global. The water challenges such as water scarcity, drought, flooding, water pollution, and deterioration of aquatic ecosystems are generic in the sense that they are seen all over the world although to a varying extent and the market for solutions to meet these challenges is out there. Therefore, it makes no sense to act local. Innovation strategies nowadays have an international focus, and entrepreneurs and start-ups are painfully aware of this.

If one has a good solution to whatever major water challenge, there should in principle be no limit to the commercial success of such a solution. But why is it then so, that very few new major water technology companies have been created in Europe within the last 30 years? What became of all the skilled researchers and their brilliant ideas? This is the schism for European innovation on water.

In the water sector, the key innovation players are the researchers with an entrepreneurial mindset together with the users, often the utilities. Most national and European research programmes in Europe – most notably the EU framework programmes - are by their own words in the territory of innovation. H2020 is not a research programme. Many of the researchers are beginning to understand the new paradigm and the rules of the innovation game – that you have to create solutions often in triple helix cooperation with those who benefit from the solutions, and that you have to contribute to growth of the (national? European?) economy.

So far so good. Upstream technology development is getting better. There are, however, a number of barriers for European innovators when it comes to downstream market development, especially when it comes to export of integrated solutions with different actor across the sector working together. One thing is that there is still in many countries a very traditional mind-set, which prevent researchers and entrepreneurs to cross borders to cooperate with companies and end users. Danish researchers and entrepreneurs work together with Danish companies and end users. The European Research Area is fictional in the sense that there are very few crossing lines.

But the real showstopper is that most entrepreneurs and start-ups do not have the strength, experience and abilities to conquer the global markets. It requires geographical presence and huge sales budgets, and they simply do not have resources for that. And it requires that they become partner in consortia where their component is a part of a broader integrated solution. In addition, there is a lack of innovation brokers or facilitators, which could help them to join such consortia. Facilitators bring together the key actors to create integrated solutions and bring them to the market. There is no distinct business models for facilitators who do the risky job to identify and approach customers for new innovative solution, to form consortia, and to write proposals and sign the contracts on behalf of the consortium. In contrast to the energy sector, facilitators in the water sector are small entities, vulnerable to cash flow fluctuations and risks of failure.

Therefore, now is the time to overcome this deadlock. New financial instruments for real support to entrepreneurial minds and start-ups in their international ventures and incentives for innovation brokers and facilitators must be brought to the table. A good start could be the 9th Framework programme as a co-financing facility for the national instruments. If Europe does not act on this now, we will also in the coming years witness that European water businesses will lag behind.

To overcome some of the barriers for international business development, the key actors in the water sector have found other ways to international exposure. Some of the European water platforms created in recent years have offered a good alternative to that, and pan-European initiatives like Water JPI with its daughter project IC4WATER and China Europe Water Platform (CEWP) have been strong instruments for reaching out to the international water community and flag European solutions and technologies. IC4WATER has as one of the objectives to develop means to solve the problems of valorization of European research.

EWA is well aware of the barriers for international business development, and therefore we support these platforms. EWA will from now on focus more on research and innovation by creating a new membership category for research institutions. To that end, we will through our networks strive to influence national governmental agencies and financial institutions and the EU Commission to create financial instruments with real value for entrepreneurs and SME's with international ambitions.

DBU fellowships

The DBU (Deutsche Bundesstiftung Umwelt, German Federal Environmental Foundation) awards fellowships for above average graduates from all study areas to conduct projects in all fields of environmental protection and nature conversation. Interdisciplinary workshops during the fellowship assure the creation of a strong network between environmental experts of all disciplines.

Fellowships for graduates from Central and Eastern Europe

For graduates from Bulgaria, Estonia, Kaliningrad, Latvia, Lithuania, Poland, Romania, Slovakia, Czech Republic, Ukraine, Hungary, the Balkan States: Albania, Bosnia and Herzegovina, Kosovo, Croatia, Macedonia, Montenegro, Serbia, Slovenia we provide fellowships for 6-12 months advanced qualification at German host institutions such as universities, research institutes, companies, environmental- and nature protection agencies and authorities, NGOs, associations etc..

During the scholarship practical solutions for current environmental issues are developed. After their stay in Germany the alumni are well qualified to tackle these issues in their home countries thus assuring efficient knowledge transfer. DBU can support finding a host institution in Germany. Own initiative of the applicants is highly appreciated. The host can still be defined after approval of the scholarship. The host institutions provide the workplace and guarantee professional supervision.

Application can be prepared in German or English. Sufficient knowledge of the German language needs to be proven at the beginning of the stay at the host institution. An intensive German language course is provided at the beginning of the stay in Germany. Further information concerning the requirements, the application process, country-specific deadlines etc. can be found under https://www.dbu.de/stipendien_international.

Fellowships for PhD students

For highly motivated PhD students we provide PhD fellowships with duration of three years at German universities and research institutes. We would like to qualify young scientists with high environmental competences as well as achieve scientific advancement and innovative solutions for environmental issues.

For the PhD fellowships, German language skills are required: the whole application process (written application plus interview) takes place in German. Further information concerning the requirements, the application process etc. can be found under https://www.dbu.de/stipendien_promotion.

DBU – we support innovation

Furthermore, the DBU - in accordance with its foundation goals and mission statement - supports innovative, exemplary and solution-oriented proposals for the protection of the environment, with special consideration for the needs of small and medium-sized enterprises.

Projects seeking support should be intended to produce sustainable practical results, serve to provide a stimulus, and lead to a "multiplier effect". It is the objective of the DBU to contribute to the solution of current environmental problems, in particular, which result from unsustainable business practices and lifestyles. The DBU sees its crucial challenges primarily in the areas of climate change, biodiversity loss, unsustainable use of natural resources, and harmful emissions. The support subjects and related projects are tied to both current scientific findings regarding planetary limits and to the United Nations' Sustainable Development Goals.

DBU funds all environmental relevant topics ranging from laboratory work over desktops studies to field work.

Birgit Collin-Langen

Since 2012, Birgit Collin-Langen is a Member of the European Parliament. She is a Member of the Environment Committee (ENVI) and one of her main focuses are water issues.

Before her carrier in the European Parliament Mrs Collin-Langen was Lord Mayor of the city of Bingen for 16 years. Focus of her activity were the protection of public interests and boosting the community engagement in water management.

Current Water Challenges and European Answers

Introduction

Fresh water as a quintessence of life is clearly an utterly essential element for everything on earth. Hence, water management constitutes a key component of the three pillars-sustainable system, which consist of social stability, economic development and environmental protection. Water is connected to food in multiple ways, to energy production and supply chains that deliver goods to consumers.

Sustainable water management is one of the most important European challenges of our time, whilst security of water provision rapidly becomes a global challenge. Addressing the issue of **quality** and **quantity** of water will play a fundamental role in moving towards a low-carbon, resource-efficient and climate resilient economy by 2050. However, a number of current pressures are affecting transition towards a sustainable management of water. Quality of water resources is strongly impacted by economic activities but as well by rapidly changing demographic trends. Intensive water extraction and climate change put additional pressure on fresh water sources and on the health of the water ecosystems.

In order to relieve the escalating pressure on our resources it is important to switch from linear consumption pattern for more circular solutions. Improving water management should be at the heart of this transition.

To accompany this transition and boost sustainable water governance a number of legislative acts and supportive initiatives have already been adopted at the EU level.

In order to ensure healthy water for the ecosystem and coming generations it is essential that all water users perform better. At institutional level further policy coordination, research and exchange of best practices and investment in water supply are needed to improve quality and quantity statues of water.

This article briefly identifies and analyses some of the main pressures on water resources, which affect the quality and quantity of water. Simultaneously it identifies adopted legislative acts and initiatives, which aim to address water challenges and draws some recommendations.

1. Quality of water

Quality of water is impacted by a variety of pollutants, which are discharged on a daily basis. Sewage works, discharges from manufacturing and industrial plants, from animal rearing, fish farming and agriculture, urban surface water run-off and seepage from domestic and industrial landfill are the main sources of water pollution. Under the objective of the Water Framework Directive of 2015, Member states had to achieve a good chemical status of their surface waters. However, by this deadline only half of the European waters were able to achieve the quality objective. The presence of a variety of pollutants from different sources complicates the compliance with legal requirements and demands coordinated and cross-sectorial measures.

1.1. Nutrients in water

Phosphorus (P) and nitrogen (N) are useful primary nutrients, but in excessive amount, they pollute water sources and cause numerous problems. Anthropogenic activity have altered natural cycle of nutrients and over the past 20 years, nitrate concentration has almost doubled in some European countries[1].

Over-fertilisation as a part of the rising agricultural production as well as discharges from urban wastewater treatment plants and the industry are main sources of nutrient pollution. Excessive nutrients are loaded in waters, causing consequently their **eutrophication** and **acidification**. These processes dramatically reduce the quality of water bodies: a poor oxygen level provokes problematic algae blooms, which cause in its term species abundance and decrease of biodiversity. High concentration of nitrate in drinking water is also considered as a public health problem. Exposure to high level of nitrates has a major effect on transport of oxygen to tissues and can have potential carcinogenic effects[2].

Restriction of use of water with high nitrate concentration for consumption and other purposes has in its turn negative implications for the provision of ecosystem services such as drinking water, fisheries, and recreation opportunities and can be costly to remediate.

At the European Union level, several legal and institutional mechanisms are put in place in order to protect water quality and to control the nitrate presence in water. The European Water Framework Directive (WFD)[3] is the main legal instrument aiming to protect the good status of surface and ground waters. Together with its accompanying directives, it constitutes a complete legal framework. According to the environmental

1 http://www.who.int/water_sanitation_health/dwq/chemicals/nitrate-nitrite2ndadd.pdf

2 http://www.who.int/water_sanitation_health/dwq/chemicals/nitrate-nitrite2ndadd.pdf

3 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy. OJ L327, 22.12.2000

objective of Article 4 of the WFD, Member States should report on nutrient and other organic pressure matters. Thus, nutrient conditions should be consistent with good water status but may require considerable actions to achieve the overall target.

The Nitrate Directive[4] is another legal mechanism, which aims to improve water quality by promoting the use of good agricultural practices. It requires Member States to identify water bodies presenting a high nitrate concentration or presenting risks of pollution, designate the nitrate vulnerable zones and monitor and report nitrate concentration in water bodies. Engagement and cooperation with farmers is an integral part of the implementation process. As farmers are becoming involved in environmental protection, in exploring new practices and manure processing, the nutrient concentration is decreasing and the quality of water bodies is gradually improving.

The Drinking Water Directive has regulated the level of concentration of nitrate in drinking water since 1980 . This establishes [5]a guide level of nitrate of 25 mg/l and a maximum admissible concentration of 50 mg/l. This standard level is considered to be well implemented across Europe. In the light of the ongoing review of the Drinking Water Directive's quality standards[6], it is important to take into consideration the latest scientific data to make sure that European legislation gives an appropriate response to current water challenges[7].

Reduction of the nitrate in surface and ground waters is impossible without the active participation of farmers. In his speech at the Joint OECD-European Commission Event on "Pathways to Policy Change on Water in Agriculture" Commissioner Hogan confirmed that it is important to develop synergies between different policy initiatives and to involve all pertinent actors. In this regard, he mentioned several measures such as creation of the Task Force on Water, which aims to develop a long-term alliance between different commission services or the creation of a platform for on-farm nutrient management[8].

1.2. Chemicals in water

Some natural or synthetically produced substances entering the water cycle can be toxic and cause a severe biological harm or death after exposure. One of these substances are pesticides. Pesticides include among others herbicides, growth regulators, biocides etc. They aim to prevent, destroy or control a harmful organism (pest) or disease, or protect plant or plant products during production, storage and transport[9].

They are considered as **persistent organic pollutants** and pose a serious risk to aquatic life and human health even in low quantities. Pesticides are not soluble in water and are rapidly absorbed in fatty tissue of fishes, birds and mammals[10].

4 Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources

5 Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption

6 http://ec.europa.eu/environment/water/water-drink/review_en.html

7 A new study from Aarhus University now shows that there is an increased risk of colon and rectal cancer in connection with nitrate in drinking water. Also at concentrations far below the current drinking water standard: Jörg Schullehner, Birgitte Hansen, Malene Thygesen, Carsten B. Pedersen, Torben Sigsgaard. Nitrate in drinking water and colorectal cancer risk: A nationwide population-based cohort study. International Journal of Cancer, 2018; DOI: 10.1002/ijc.31306

8 Phil Hogan Speech at Joint OECD-European Commission Event on "Pathways to Policy Change on Water in Agriculture" - 20th February 2018, Brussels: https://ec.europa.eu/commission/commissioners/2014-2019/hogan/announcements/speech-joint-oecd-european-commission-event-pathways-policy-change-water-agriculture-20th-february_en

9 https://ec.europa.eu/food/plant/pesticides_en

10 The European Union and the Stockholm Convention implementing measures on persistent organic pollutants. http://ec.europa.eu/environment/chemicals/international_conventions/pdf/convention_stockholm.pdf

Agriculture is as a key pathway for pesticides in European waters, as the highest quantities of pesticides in ground water are found in intensive farming areas[11]. Problematic pesticides include the herbicides alachor and isoproturon, which together contribute to poor water status in 11 Members States[12].

A number of legal mechanisms complete the European water policy establishing the framework for Community action to achieve the sustainable use of pesticides. Here is an overview of several of them:

- Under the WFD, Member States have to monitor and assess the risk posed by the presence of pesticides, as well prevent and control the input of the pollutants and to take measures to meet the relevant quality standards.
- The Environmental quality standards Directive (EQSD) is an accompanying directive of the WFD, which lays down environmental quality standards (EQS) in form of concentration limits for priority substances and certain other pollutants with the aim of achieving good surface water chemical status.
- Directive 2009/128/EC[13] aims at reducing risks and negative impacts of the use of pesticides and promotes a sustainable pesticides management, alternative approaches and techniques in pesticides application. Even though this directive does not directly apply to water resources, it is compliant with EQS on priority substances linked to the WFD. It requires Member States to adopt National Action Plans setting up quantitative objectives, targets, measures and timetables to reduce risks and impacts of pesticide use on human health and the environment. Member States must adopt measures to protect the aquatic environment and drinking water supplies from the impact of pesticides.
- Application of the Directive 91/414/EEC[14] and of the Regulation EC 1107/2009[15] on plant protection products contributes to the removal from the market of many hazardous substances thereby reducing risks for users, consumers and environment.
- The Drinking Water Directive requires that the level of individual pesticides in water at the consumer tap should not exceed 0.1 µg/L with the maximum total concentration of 0.5 µg/L. These standard levels should apply to all pesticides and their degradation products. The European standard, compared to for example the WHO approach, is based on a highly precautionary approach, which ensures the high level of human health protection.
- In the framework of the Common Agricultural policy Pillar I and II the measures are previewed to prevent direct and indirect pollution of water by pesticides discharges.

Another important group of water pollutants is heavy metals. They count in average from 20% to 60%[16] of the total share of the pollutants in water bodies in poor chemical status. Once dissolved in water, they can enter the food chain via phytoplankton, affecting the aquatic ecosystem, and via fish, they can reach higher levels of the food chain, presenting the danger for human health.

While the presence of heavy metals such as cadmium, lead, mercury, selenium and arcenic are already subject to European Standards, there is number of pollutants, which are not yet properly addressed. Examples include perfluorinated and endocrine disrupting compounds, which presence is a big water quality challenge.

11 Moss B. Water pollution by agriculture. Phil. Trans. R. Soc. B (2008) 363, 659–666 doi: 10.1098/rstb.2007.2176

12 SWD "Agriculture and Sustainable Water Management in EU" SWD (2017) 153

13 Directive 2009/128/EC of the European Parliament and of the Council establishing a framework for Community action to achieve the sustainable use of pesticides OJ L 309, 24.11.2009, p. 71.

14 Directive 91/414/EEC on evaluation, authorisation, approval of active substances at EU-level and national authorisations of PPPs plant protection products OJ L 230, 19.8.1991, p.1

15 Regulation EC No 1107/2009 of The European Parliament and of the Council concerning the placing of plant protection products on the market

16 EEA; European waters

EDCs pollution is becoming a vital environmental concern and might have a deleterious effect on human, animal and plant growth and development[17]. Attention to this issue is crucial and demands further in-depth investigation. In the framework of the review of the Drinking water Directive, European Commission takes into account the WHO recommendations, proposing the precautionary benchmark values for three representative EDCs - beta-estradiol, nonylpheol and bisphenol B. Even though these components are relatively insoluble in water and can be effectively removed by conventional water treatment methods, further consideration of the possible negative impact of EDCs on human life and aquaculture should be based on a rational approach.

The perfluorinated compounds are persistent, bioaccumulative and toxic substances. They are found in ground water primarily because of the contamination of soils by the fire-fighting foams but as well as a result of discharges by factories, which use or manufacture these chemicals. Perfluorinated compounds as PFOS (perfluorooctanesulfonic acid) and PFOA (perfluorooctanoic acid) are already subject to restrictions under European legislation: PFOS were initially included into the list of the restricted substances in REACH. In present, they are regulated as a persistent organic pollutant under Regulation 850/2004. PFOA were added to the list of restricted substances in the REACH regulation, as the Commission considers that their manufacturing, producing and selling can lead to inacceptable risk for human health.

In the framework of the review of the Drinking Water directive, the European Commission proposes to regulate the perfluorinated compounds based on the OECD definition and values. It is important that the values are feasible to reach.

1.3. Safety of tap water

Ongoing work:

- Harmonisation of the materials and articles coming in contact with water intended for human consumption,
- Better access to information about water quality

1.4. Pharmaceuticals in water

Ongoing work:

- Public consultation on Pharmaceuticals in water
- Challenging balance between the water quality and health protection

2. Quantity

2.1. Water re-use

Ongoing work:

- Expected proposal on water reuse - the challenge of cost-efficiency

2.2. Access to water

Ongoing work:

- New Article 13 of the Drinking water directive and the concept of the **equitable** access to water

2.3. Water extraction - impact of the agriculture

Ongoing work:

- Staff working document (White paper of the Commission) agriculture and sustainable water management in EU
- Task force on Water - to develop the alliance between different commission services
- Knowledge Hub on Water and Agriculture to support a cross-sectorial EU-policy making in the field of water and agriculture

3. What should also be improved?

- Clear identification of water-related targets (match the objectives of the water management plans with the rural development programs)
- Alignment and convergence of the environment and agricultural strategies
- Better coordination of the cross-sectorial cooperation
- Financial support for farmers to support the implementation of the water and nutrient management;
- Research and innovation, exchange of the best skills and practices
- Balanced fertilizers application
- Behavioural change in farmer's community
- Reinforcing the inspection system and simplifying the monitoring

Conclusion: We have already achieved a lot and made good progress - now it is important to stay encouraged in order to join our forces to draw a path to the remaining challenges ahead.

17 Muhammad Adeel a, Xiaoming Song a, Yuanyuan Wang a, Dennis Francis a, Yuesuo Yang. Environmental impact of estrogens on human, animal and plant life: A critical review. Environment International 99 (2017) 107–119

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Main activities

The Association is a professional, non-profit organization of water supply and sewerage professionals with a Mission Statement consisted of four main objectives:

- To advocate the collective interests of professionals in the water sector in Albania.
- To serve as a leading resource for knowledge, professional development and networking.
- To invest time and resources to build awareness and attract future generations to seek a career in the water sector.
- To be a positive force for mutual understanding, collaboration and regional partnerships in the Western Balkans.

The Association serves the water sector through outreach programs consisting of its award winning Children's Water Awareness Program; World Water Monitoring Challenge, High School Science Fair, University Student Summer Internship Program; bi-lingual newsletter and website; routine training programs; Annual Conference and Exhibition; IWA Biannual Utility Management Conference and a Young Water Professionals section. The Association is also involved in medium and large scale project grants that provide value to knowledge sharing in the water sector and opportunities to young professionals to gain more experience in their profession.

Recently, the Association in partnership with the Ministry of Transport and Infrastructure of Albania and with the financial support of United States Agency for International Development (USAID) is working on the development and implementation of a sustainable, national training program to improve the capacity of the sector workforce, leading to certification as a qualification for employment in the sector.

The remaining challenges that have been defined by the Association are advocating and supporting actions toward the regionalization of water supply and sewerage services, as a mean to improve performance and the economies of scale in the sector, and to being greater focus on the commercialization of utility management practices to achieve full cost recovery from revenues.

Austria

Österreichischer Wasser- und Abfallwirtschaftsverband (ÖWAV)
Austrian Water and Waste Management Association

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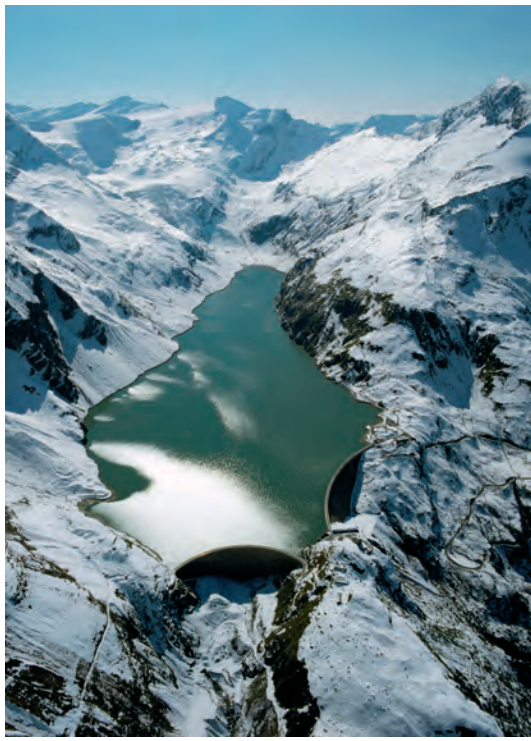
Main activities

The Austrian Water and Waste Management Association (ÖWAV) is a voluntary collective of all parties interested in water and waste management in Austria, which leads to the exchange of experience in economy, administration and science. It is considered as an "independent counsellor" with the goal of achieving sustainable objectives of the water, wastewater and waste management in Austria.

Challenging topics

- Climate change
- Buildings and Water
- Sewage sludge platform
- Maintenance of Sewage Systems
- Courses and advanced training for the staff of water treatment plants and waste management facilities.



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VLARIO activities:

- VLARIO is an independent non-governmental and non-profit organization in Flanders (Belgium)
- VLARIO is the consulting platform and information and knowledge centre for the Flemish sewer sector
- VLARIO offers an independent platform for experts of rainwater, wastewater and sustainable water management;
- VLARIO collects knowledge through continuous consultation and exchange of experience with all market players, national and international;
- VLARIO propagates this knowledge via publications and the organization of seminars, workshops, lectures and study clubs;
- VLARIO supports the ambition of Flemish towns and cities in purifying quality and applying the 'Principles of integrated sewage management'.
- VLARIO has 450 members, such as most of the Flemish towns and cities, regional authorities, Aquafin, consulting engineers, contractors and industrial companies.
- Vlario is involved in quality control on house connections, following the regional rules of separate sewer connections
- Based near Brussels, Vlario is participating in most of the European conferences and hearings
- Vlario is striving to act as the multiplicator between all the wastewater actors and sewer operators in Flanders-Belgium.

Bulgaria
Bulgarian Water Association (BWA)
Bulgarska Asociacia po Vodite

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Main activities
BWA is a non-governmental, non-profit organization whose main fields of interest are water supply and wastewater disposal and treatment, as well as management, preservation and utilization of water resources. It takes part in discussions related to new regulations and develops expert appraisals, standpoints and strategies in its field. BWA organizes workshops, conferences, round tables and is also involved in the training of water/wastewater operators. As of January 1st 2015 the Association has 127 corporate and 354 individual members.

Challenging topics

1. Water loss reduction
2. Water Act amendments implementation
3. Education and training of water/wastewater operators
4. Assistance to the development of Strategy for Water Supply and Sanitation Sector Development
5. Urban water infrastructure rehabilitation
6. Waste water treatment plants construction
7. Benchmarking in the Bulgarian water sector

Croatia

Croatian Water Pollution Control Society (CWPCS)

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Main activities
With around 600 individual, institutional and company members, the CWPCS is a voluntary, non-profit association of citizens and legal entities joined together to promote water protection and other water related issues. Established in 1979 as the first environmental organization in this part of Europe, today the CWPCS has an important role in the education of new generations of water professionals in different fields of water management, e.g. through organisation of practical seminars, workshops and lectures by national and international experts in Croatia.

The CWPCS has always had close cooperation with other national organisations, working towards improving relations, exchange of experience and solving neighbourhood problems.

Members of the CWPCS are actively involved in preparing national legislation and projects related to water protection and water management. They are also engaged in the work of EWA and participate in the work of EU working groups of CIS of the WFD.

Challenging topics

1. Capacity building of the CWPCS into a self-sustained, professional institution capable of spreading the information, knowledge and competence gained in relation to water policy and implementation of new technologies.
2. Strengthening the cooperation between young experts, scientists and decision makers in Croatian water management.
3. Improvement of sewerage and WWTP operation in Croatia through education of maintenance personnel.
4. Contributing to the development of optimal solutions for WWTP sludge treatment and disposal for Croatia.

Czech Republic

Asociace pro vodu ČR
The Czech Water Association (CzWA)

President
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EWA Council Representative
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Main activities
The CzWA is the association representing Czech specialists and companies working in the fields of wastewater, waste and water management and quality control of surface waters. The main activities of the association cover both technical-scientific subjects and the economic and legal aspects of water environment protection. The association provides consultancy to the state and local authorities and to private subjects. The CzWA organizes professional seminars and conferences on both national and international level and provides training courses on different levels. As an example the EWA-IWA workshop on “History of sanitation and wastewater treatment in large towns” can be mentioned.

Challenging topics
The number of CzWA specialist groups has reached fourteen and the groups cover most of the professional topics in water sector. After prolonged periods of drought in 2014 and especially in 2015 a new challenge appeared in the Czech water sector, namely, the reuse of treated water connected with wastewater tertiary treatment and disinfection. The CzWA has finished its conversion from initially wastewater association to association of all Czech water professionals and has become an adequate member of international organizations like EWA or IWA.

CzWA wants to continue or to improve the cooperation with water associations in neighbouring countries. CzWA has contract on cooperation with AČE in the Slovak republic, ÖWAV in Austria and DWA in Germany. CzWA has also established good working contacts to MaSzeSz in Hungary. The cooperation with neighbouring association helps to keep the standard of CzWA biennial conferences on high scientific and technical international level. The international contacts of the CzWA makes the association more attractive for young water professionals (YWP) who are now forming a significant fraction among the CzWA individual members.

Denmark
Danish Water Forum (DWF)

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Main activities

Danish Water Forum (DWF) is a network of Danish water organisations aimed at highlighting expertise and knowledge and facilitating concerted actions. The competences and high standards of its members make DWF an excellent entry point to the Danish water sector and its services and expertise within virtually all aspects of water industry, technology, science and management. DWF represents: contractors and manufacturers, water companies and Consultants, research institutions, governmental and other public institutions and NGOs

The unique member blend of RDI, industry, organisations and public bodies gives DWF an integrated knowledge about all aspects of the entire water sector, including issues relating to the environment, agriculture, energy, and health. DWA has 2 main areas of interest, which are 1) RDI and entrepreneurship in the sector and 2) to build partnerships across the sector to provide sustainable solutions and to build international partnerships through international organisations.

Challenging topics

1. The political focus in the water sector in Denmark is to develop sustainable solutions and technology which at the same time address the various issues in relation to water in Denmark and also can be applied internationally and thereby create growth for Danish companies and the Danish society. DWF supports that political strategy by working together with governmental export entities and with companies and institutions with international ambitions.
2. The global climate changes will have a tremendous impact on specific regions in the world, especially in the poor countries. DWF will work for ensuring that donor organisations draw the climate change into their planning of donor funded projects to ensure "climate-safe" project results.

Estonia
Eesti Veeühing
Estonian Water Association

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Arvo Järvet

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Main activities

The Estonian Water Association promotes and facilitates evolution of legislation, terminology, education, science and engineering of water management.

It offers opinions on Estonian water management problems, arranges meetings, events and conferences related to water usage, surface and groundwater protection and others water management sectors. Estonian Water Association is an active partner in River Basin Management Planning process. During the recent years numerous public consultations on draft planning documents have been organized in different regions in the country as well as excursions to relevant objects/locations of interest. Traditional events held every year include the Annual Meeting, conference for celebrating the World Water Day, two days excursion in the summer and an autumn seminar.

SUOMEN VESIYHDISTYS RY
Water Association Finland

Finland

Suomen Vesiyhdistys ry
Water Association Finland

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Main activities

The Water Association Finland is a non-governmental body with some 500 individual members and 20 corporate members, founded in 1969. The purpose of this body is to improve and distribute knowledge and promote professional networking in Finland and abroad.

Purpose of the association is to improve and disseminate knowledge and promote professional networking in Finland and abroad on hydrology, limnology, water ecology, fisheries, water supply, hydraulic engineering, water pollution control and water legislation. The core issues are mostly dealt with by standing committees for History, Wastewater, River basins & fisheries, Water quality, Groundwater and Water supply & sewerage.

Challenging topics

1. The renewed Finnish water legislation.
2. Implementation of the EU Water Framework Directive.
3. Climate change effects on water management and water environment.

France

Association Scientifique et Technique pour l`Eau et l`Environnement association (ASTEE)
("Scientific and Technical Association for Water and Environment")

President
Christophe Perrod

Executive Director
Carine Morin-Batut

EWA Council Representative
Maria Salvetti

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Main activities

Since its founding in 1905, the "Association Scientifique et Technique pour l'Eau et l'Environnement (ASTEE)" has been a privileged centre point for the exchange of technical, scientific and administrative information between the various persons and organisations involved in the design, production and operation of urban and rural equipments and infrastructures, with a strong emphasis on environment and hygiene related utilities. Water ecosystems and resources are also addressed in a more global view. The association welcomes all persons and organisations involved: industry, consultants, operators, academics and scientists, technicians and local communities, hygiene specialists, doctors, regulators, government and local community engineers, administrators, managers.

ASTEE handles all the different aspects of urban engineering and rural engineering, in relation to utilities, infrastructures, and natural assets: water, drainage, waste, hygiene, disinfection, urban planning, habitat, traffic, viability, transportation, lighting, urban amenities, cleanliness of public places, atmospheric pollution, noise, hydrology, water supply, corrosion, sanitation, urban networks, development plan, surface management etc…

ASTEE's aim is to promote studies and research work for the environment, public hygiene, urban development, rural development; to favour the exchange of ideas and information between all involved parties.

Challenging topics

1. Creation of a workgroup across technical committees for working on performance indicators of water and sanitation utilities
2. Contribution to the preparation of the World Water Forum 2012 in Marseille, over various topics, joining forces with all French water stakeholders and parties to welcome all the participants and visitors
3. Further development of the collaboration with other French water association, in order to work together on key issues

Germany

Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e. V.
German Association for Water, Wastewater and Waste (DWA)

President
Bauassessor Dipl.-Ing. Otto Schaaf

Executive Director
Bauassessor Dipl.-Ing. Johannes Lohaus

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Activities

The DWA – German Association for Water, Wastewater and Waste – is intensively committed to the development and distribution of a secure and sustainable water management. It acts as a politically and economically independent organisation in the field of water management, sewage, waste and soil protection.

DWA provides professional competence regarding standardisation, professional training and information towards the public. Approximately 14,000 members represent the experts and executives from local authorities, universities, engineering offices, municipalities and enterprises.

Main emphasis of its activities is placed on the acquirement and update of a consistent technical set of rules and standards as well as cooperation in the formulation of technical norms on national and international level. Furthermore, DWA also offers professional training as well as further vocational training. There are not only technical scientific topics involved, but also economic and legal interests of the environment and water protection are concerned.

Hungary

Magyar Szennyvíztechnikai Szövetség (MaSzeSz)
Hungarian Wastewater Association

President
DI. Károly Kovács

Secretary General
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Main activities

The Hungarian Water Association was founded in 1997. The Association has around 300 individual, institutional and company members. The members are mostly designers, operators, experts, students and professors from different institutions, universities and business entities dealing with municipal water and river basin management.

The main activities and objectives of the Association are:

- Support technical and scientific cooperation between members
- Provide practical, technical and scientific information towards members, municipalities and authorities
- Support and integrate young scientists
- Cooperate with the government on development of regulations
- Cooperate with other civil local and international organisations in water related questions
- Organising national and international conferences
- Develop, edit, distribute, and provide educational services for technical and cost comparison guidelines

Challenging topics

1. Strengthen the cooperation with decision makers on the public water sector
2. Strengthen the communication towards civil players on the water sector
3. Strengthen the exchange of experiences between regions and neighbouring associations
4. Support the integration of the Hungarian water sector into the international professional network

Latvia

Latvian Water and Waste Water Works Association (LŪKA)

President
Andis Dejus

Executive Director
Baiba Gulbe

EWA Council Representative
Andis Dejus

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Activities

The Latvian Water and Wastewater Works Association is a non-profit organization which unites 30 utilities and 10 associated members- companies working within the field of water and wastewater management- pipes and fittings construction, design of technological solutions and consulting.

Association was founded on the 24th of May, 1990 are the one of oldest professional associations in Latvia. The abbreviation of the association LŪKA in Latvian phonetically means "a manhole cover" and for waterworks specialists this means protection and cover.

Main goal for association and its members are to provide good quality water supply and sewerage services for the best interests of the society of Latvia. As well as association represents its members as a united body in the state and administrative institutions, and in other organizations as well as shares amongst its members the information, acquired from these institutions and organizations.

During the last years, for the modernization of Latvia's water management systems, huge financial, work and knowledge resources have been invested. The Law On water Management services are in force from 1 January 2016.That means water companies faced a lot more managemental chalenges than previous.

This unique experience could serve as a good example for municipalities and businessmen of other countries. As a basis for sharing of experience for Baltic countries, association together with Estonia and Lithuania every year organizes Baltic water works conference and other international activities. Main International activity of the last year was EXPO 2017 Astana where association represented knowledge transfer possibilities via GreenBridge forum

Future challenges relates to overall water management policy implementing in Latvia, sludge management and lifelong learning for professionals.

Luxembourg

Association Luxembourgeoise des Services d'Eau (ALUSEAU)
Luxembourg Association of Water Services

President
Raymond Erpelding

EWA Council Representative
Raymond Erpelding

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Main activities

ALUSEAU is the national association of water services in the Grand-Duchy of Luxembourg, regrouping members of the drinking water sector, the wastewater sector and other public actors active in water management. ALUSEAU is a politically independent and non-profit making association. The main objectives of the association are to promote the common interests of all authorities and public services dealing with water management. To that effect ALUSEAU aims at advocating the study of all scientific, technical, economic and administrative problems relating to drinking water supply and sewage collection and treatment, promoting a suitable management of the water resources of the country. ALUSEAU is also representing its members in international associations dealing with the same objectives just described.

The core business of the association is to:

- Keep contact between the different water services
- Keep contact with the national authorities
- Being involved in the outworking of national directives

Challenging topics

1. The European water framework directive was transposed in 2008 into national legislation. ALUSEAU helps the national authorities to transpose and implement the new water law and to introduce the cost recovery principle in water pricing.
2. In 2014 starts the second cycle of the elaboration of the Management Programs (2016-2021) regarding the Water Framework Directive. ALUSEAU will be strongly involved in the different working groups organised by the National Water Administration.

Norway

Norsk Vannforening
Norwegian Water Association (NWA)

Chair person
Lars Hem

Executive Director
Tone Margrethe Karlander Juel

EWA Council Representative
Harsha Ratnaweera

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Main activities

The Norwegian Water Association (NWA) is an independent non-governmental and non-profit organisation dealing with the management and improvement of the water environment. The NWA provides a forum for discussion of key technical, scientific and policy issues on water covering both water resources and water quality. Through this exchange of knowledge, the NWA significantly contributes to sustainable water management in Norway. The NWA has about 900 individual and 450 corporate members.

The implementation of the Water Framework Directive in Norway is one of the core activities. Furthermore, Water Quality Issues, Watercourses and Coastal Areas, Aquatic Ecosystems and Biodiversity, Water Quality Monitoring, Water Supply and Health Effects, Sanitation, Impacts of Hydropower Development, Effects of Long-transported Airborne Pollutants, Effects and Adaptation of Climate Changes are activities which are just as important to the NWA.

Challenging topics

1. Continuing the development of the administrative and organisational capacity of the association.
2. Establish new regional committees in order to spread the activities of the association in the major regions of Norway.
3. Recruiting new members by information and more visibility of the association.

Portugal

Associação Portuguesa de Engenharia Sanitária e Ambiental (APESB)

President
Prof. Paulo Jorge Ramisio Pernagorda

EWA Council Representative

Prof. José Saldanha Matos

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Main activities
The Portuguese Association for Sanitary and Environmental Engineering (APESB) is a non-profit, scientific and technical association, founded in 1980, for an indeterminate period of time, recognised as a corporate body of public interest since March 1990.

APESB has the following objectives:

- To be a national body especially oriented to the study, analysis and discussion of aspects related with water supply, drainage, treatment and final disposal of wastewater and the collection, treatment and final disposal of solid waste, in order to contribute to the implementation of better, feasible and sustainable solutions.
- To foster the technical and scientific exchange, including technology transfer and training, in the fields of water supply, drainage and treatment of wastewater as well as solid waste, at the national level and in the Portuguese-speaking countries.
- To contribute to the scientific and technological development of subjects related to water supply, drainage, treatment and final disposal of wastewater and collection, treatment and final disposal of solid waste.

Furthermore APESB has the following core activities:

- Water Treatment and Supply
- Wastewater Systems
- Water quality and pollution control
- Solid waste (collection, treatment and disposal)
- Health related subjects

Challenging topics for the future

- Health related topics
- Climate changes and water and wastewater systems
- Water reuse

Romania

Romanian Water Association (RWA)

President
Felix STROE

Prime Vicepresident
Ilie VLAICU

Executive Director
Constantin PREDOI

EWA Council Representative
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Main activities:
Romanian Water Association is a professional, non-profit and an employers association, established in 1995, with the following main objectives:

- To represent and to promote the interest of it's members
- To support the capacity development at the level of the Romanian water sector
- To improve the quality of the water services in Romania to meet the EU requirements
- To improve the quality of life and environment by providing water supply and sewerage services of better quality

Challenging topics:

- Ensuring access to water services at EU standards for the entire population of Romania
- Implementation of large investment programmes at the level of regional water operators
- Implementation of the benchmarking sistems and assurance of its sustenability at the regional water utiliies level
- Sludge management
- Reduce water losses
- Improve the capacity of the regional water utlities by training programmes and transfer of know-how

Serbia

Serbian Water Pollution Control Society (SWPCS)

President
Dr Milan Dimkić

Executive Secretary
Mr. Aleksandar Djukić

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Activities
Serbian Water Pollution Control Society (SWPCS) is a non-profit independent organisation of experts in water sector which was established in 1966. The main objective of the Society is to create and foster the network of leading water professionals through the provision of services and products to the members, including conferences, publications and support for member groups. In addition, to represent the views of members in the national and international forums aimed at advancing best practice in the sustainable water management.

Challenging topics

1. Provide expert's opinion on new legislation and policies.
2. Provide specific training on critical issues in the water sector (implementation of WFD, water resource management, wastewater and sludge management, diffuse pollution, etc.).
3. Strengthen the cooperation of water related NGOs in Serbia and in the region.

Slovak Republic

Asociácia čistiarenských expertov SR (AČE SR)
Association of the Wastewater Treatment Experts of the Slovak Republic

President
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EWA Council Representative
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Main activities
AČE SR is the Slovak membership association which groups professionals acting in the fields of wastewater management and water protection. AČE SR covers all aspects of wastewater pollution control, collection, treatment and disposal; promote exchange of the latest skills, techniques and knowledge on all aspects of wastewater, water and sludge management. The mission is to enable the improvement of groundwater and surface water quality in an environmentally sustainable way. AČE SR disseminates the knowledge by means of conferences, workshops, specialized meetings, publications, electronic media and expert services.

Challenging topics
1. Wastewater and water management, water protection
2. Sludge management
3. Exchange of information and experience

Slovenia

Slovensko Društvo Za Zaščito Voda (SDZV)
Slovenian Water Pollution Control Association

President
Meta Levstek

Secretary
Mojca Vrbančič

EWA Council Representative
mag. Mojca Vrbančič

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Activities
The purpose of the Association is to associate societies and individuals working in water and wastewater management, especially regarding quality issues. The main activities in this sector are to act in water pollution control, drinking and wastewater treatment; to develop consciousness of the importance of water preservation; to follow, study and work on water preservation and its uses, supplies of potable water, and dealing with used and waste waters; to inform and educate: professional, scientific and other public institutions by publications, lectures, meetings, sharing of experiences, excursions, by courses and similar activities and achievements in the field of water control; cooperation with similar local, foreign and international societies and organisations.

Challenging topics
1. The establishment of new Working Groups
2. Cooperation with administrative bodies on drinking water, wastewater treatment and excess sludge treatment
3. Attendance and participation at Slovenian annual conference "Water Days"
4. Cooperation with national and international bodies, associations and individuals on the water protection issues

Spain

Asociación para la defensa de la calidad de las aguas (ADECAGUA)
Association for Water Quality Protection

President
Manuel Suarez Novoa

EWA Council Representatives
Benito Reig and Jose Mosquera

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Main activities
ADECAGUA is a non-profit educational and technical association of water quality experts, which is economically and politically independent.

ADECAGUA cooperates with Spanish Water Quality Authorities, being part of the National Water Advisory Board (Consejo Nacional del Agua), and is the Spanish Member Association of the Water Environment Federation.

ADECAGUA has got more around 200 members that are working with private or public companies, engineering firms, universities, consulting firms etc., but the association has mostly private members.

ADECAGUA develops and disseminates information concerning the different areas of water treatments and nature, via technical seminars and meetings, collaborating on a regular base with two specialized journals in Spain.

Switzerland

Verband Schweizer Abwasser- und Gewässerschutzfachleute (VSA)
Swiss Water Association

President
Heinz Habegger

Executive Director
Stefan Hasler

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Olivier Chaix

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Activities
The VSA is the association representing Swiss specialists working in the fields of wastewater and water pollution control management. The main activities of the association cover technical, scientific, economic and legal aspects of water pollution control. The politically and economically independent association operates on a national level.

Central tasks of the association are the preparation and updating of technical standards and guidelines and professional training of members and staffs of sewage treatment plants

Challenging topics
- Micro pollutants
- Flood control and rehabilitation
- Management of infrastructure
- River basin management

Corporate Members

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Description

Messe München International is one of the world's leading trade-fair companies. In Munich alone it organizes around 40 trade fairs for capital and consumer goods, and key high-tech industries. Each year more than 30,000 exhibitors and around two million visitors take part in the events held at Messe München, the ICM – Internationales Congress Center München and the MOC Veranstaltungscenter München. The leading international trade fairs of Messe München International are all FKM-certified, i.e. exhibitor and visitor numbers and the figures for exhibition space are collected in line with agreed standards and independently audited. In addition, Messe München International organizes trade fairs in Asia, Russia, the Middle East and South America. With six subsidiaries in Europe and Asia and more than 60 foreign representatives actively serving over 90 countries, Messe München International has a worldwide business network. The Group also takes a pioneering role as regards sustainability: It is the first trade-fair company to be awarded energy-efficiency certification from the technical inspection authorities TÜV SÜD.

IFAT, the world's most important trade show for innovations and services in water, sewage, waste and raw materials management, takes place from May 5 to 9, 2014 in Munich. The last event attracted 2,939 exhibitors from 54 countries and 124,200 visitors from 182 countries. After two shows under the name IFAT ENTSORGA, the show is returning to its original name of IFAT.

Already after the registration deadline at the end of April 2013, it is clear that IFAT will once again fill all 16 halls of the Messe München trade fair center as well as an even larger portion of the outdoor exhibition site. The share of exhibitors returning to the fair is more than 90 percent. In addition, demand for space is also very high. Due to the positive response to the last exhibition, IFAT appears to be more attractive than ever, and a number of new companies also want to showcase themselves at the next IFAT.

Besides the already extensive supporting program and the Open German Championship in Wastewater Engineering (organized by the DWA), IFAT 2014 will feature several premieres like a live demonstration area for recycling of building materials and a live demonstration are for recycling of car parts as well as the new set up platform "intelligent urbanization".

Further information are available at www.ifat.de.

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Senior Vice President & President, Europe Commercial Team – Xylem Inc.

About Xylem

Xylem (NYSE: XYL) is a leading global water technology company committed to developing innovative technology solutions to the world's water challenges. The Company's products and services move, treat, analyze, monitor and return water to the environment in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced infrastructure analytics solutions for water, electric and gas utilities. The Company's more than 16,500 employees bring broad applications expertise with a strong focus on identifying comprehensive, sustainable solutions. Headquartered in Rye Brook, New York with 2017 revenue of $4.7 billion, Xylem does business in more than 150 countries through a number of market-leading product brands.

The name Xylem is derived from classical Greek and is the tissue that transports water in plants, highlighting the engineering efficiency of our water-centric business by linking it with the best water transportation of all — that which occurs in nature. For more information, please visit us at www.xylem.com.

Aquademica Foundation

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Description

Aquademica is a non-profit organization in Romania active in the environmental, water and waste water sector. The Romanian-German Foundation Aquademica was established in March 2009 by Aquatim, the regional water and wastewater operator in Timis county/ Romania, and the Municipality of Munich (Waste Water Department). Being an information and knowledge center, the Foundation promotes professional development in the environmental field and offers itself as a networking platform supporting specialists, professional organizations and companies. It also offers services aimed at providing sustainable solutions and excellence in the water and waste water sector such as: studies and surveys, environmental, economic and engineering expertise, cost comparison calculations, feasibility studies, consultancy and design.

Main advantages of Aquademica are national and international networking with universities, regional water and waste water operators as well as governmental bodies, and the transfer of good practices, already validated and acknowledged by our German partners. Pilot stations, donated by our German members, can be used for simulations of the existing technologies to be optimized, or for modelation of new technologies to be implemented.

Seminars and workshops promoted by Aquademica include theoretical support and practical simulations on the pilot stations. They can take place in any location in Romania or Germany and will be scheduled and organized in accordance with the trainees' needs and availability of the lecturer. The transfer of the German know-how is done directly by the German specialists or by using knowledge multipliers.

Association of Environmental Enterprises (KSZGYSZ)

Association of Environmental Enterprises (KSZGYSZ)
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Description

The Association of Environmental Enterprises (KSZGYSZ) is a non-profit organization, a professional business federation of the Hungarian environmental industry. The aim of the Association is to expand the information flow toward the environmental companies.

The Association has now 250 member companies and institutions covering all environmental sectors, like water, waste, clean air, noise management and remediation as well.

The Association develops services to provide information on the environmental industry by Internet databases, yearbooks of companies, organizes the international exhibition: ÖKOINDUSRTIA, national and international conferences mainly about water treatment and waste management. The Association provides information packages about the European environmental law and partnership and promotes the members international activities as well.

Examples of profiles and technologies of the members of the Association in water treatment:

- Drinking and waste water technology
- Sewage sludge treatment, optimization for waste water treatment plant
- Complex projects in water management and environmental protection,
- Water loss detection, water network monitoring systems, identify and repair of hidden leaks
- „No-dig" inspection, cleaning and of pipelines
- Effective oil elimination from water surface, oil separation for rain water

Emschergenossenschaft and Lippeverband

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www.lippeverband.de

Description

The Emschergenossenschaft and Lippeverband is a water company for the catchment area of the Emscher River and the Lippe River and its tributaries. Emschergenossenschaft and Lippeverband is the largest Association for the disposal of wastewater in Germany.

Emschergenossenschaft and Lippeverband is a non-profit company in the form of a self-managed corporation under public law, controlled by its members.

The Emschergenossenschaft and Lippeverband plans, constructs and operates wastewater treatment plants, pumping stations, dikes, sewers and rain reservoirs and maintains the bodies of water in its catchment area. The Association coordinates plans closely with its members. River Basin Management as required by the EU Water Framework Directive has already been implemented on the Emscher and the Lippe rivers.

Endress+Hauser Messtechnik GmbH+Co. KG

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Main activities

Endress+Hauser is a global leader in measurement instrumentation and solutions for industrial process engineering. With over 10,000 employees worldwide, the Group generates annual net sales of 1.7 billion euros.

Company-owned sales centers and a network of partners guarantee competent worldwide support. Production centers in eleven countries meet customers' needs and requirements quickly and effectively. As a successful family-owned business, Endress+Hauser is set for continued independence and self-reliance in the future.

Endress+Hauser provides sensors, instruments, systems and services for level, flow, pressure and temperature measurement as well as liquid analysis and data acquisition. The company supports customers with solutions and services in automation engineering, logistics and information technology. Our products set standards in quality and technology.

Customers are primarily from the chemical/petrochemical, food & beverage, water/wastewater, life science, oil & gas, power & energy, renewable energies, primaries & metal, pulp & paper and shipbuilding industries. Endress+Hauser support its customers to optimize their process procedures while taking into consideration reliability, safety, economic efficiency and environmental protection.

Erftverband

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Description

The Erftverband is a non-profit organization under public law, with a focus on a healthy environment and the common good. The organisation is financed through the fees paid by its 250 members. The Erftverband and its 500 employees reconcile the different water-related interests of the regional players in a responsible and sustainable manner and with a sense of proportion. The core region in which the Erftverband operates is the 1,920 km2 catchment area of the river Erft. The catchment contains numerous tributaries and bodies of water along with the 107 km long river. Here the organisation purifies the domestic sewage produced by approximately 750,000 residents as well as the sewage generated by local trade and industry, which is equivalent to a waste load produced by another 450,000 people. Moreover, the Erftverband looks after a fragile natural region and protects the residential areas from flooding.

However, the reach of the organisation goes far beyond the Erft watershed. The entire area of activity comprises over 4,220 km2, covering the region affected by the brown coal mines of the Rhineland. The Erftverband monitors the complex relationships involving water supply and distribution, oversees groundwater resources, ensures the water supply and protects the numerous wetlands.

Gesellschaft zur Förderung der Abwassertechnik e. V. (GFA)
(Organisation for the Advancement of Wastewater Technology)

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www.dwa.de

Description

GFA is a service company for the German Association for Water Management, Wastewater and Waste (DWA). It publishes the journals of DWA: monthly KA – Abwasser, Abfall (KA – Wastewater, Waste), KW – Wasserwirtschaft (KW – Water Management) and every three months KA-Betriebs-Info (KA – Info for Operators). In addition, GFA publishes the DWA – Industry Guide (DWA-Branchenführer), a directory of companies in the environmental industries, focussing on water and waste. GFA cooperates, on behalf of DWA, with important trade exhibitions concerning water and waste.

HACH LANGE GmbH

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Description

HACH is a leader in water analysis. For more than 80 years, HACH and Dr. Lange have developed innovative solutions used to test the quality of water for municipal and industrial customers. HACH supplies tailor-made solutions for reliably monitoring wastewater, drinking water and industrial process water.

In Europe the company history dates back to Berlin 1933 when Dr. Bruno Lange set up the company. Inventions such as the photometer and later on cuvette tests have revolutionized the field of analysis. HACH LANGE was born in 2004 when Dr. Bruno Lange joined forces with HACH, an American company specializing in electro and photochemistry.

HACH has research and production facilities in Germany, France, Switzerland, the USA and China. The company employs thousands of people across its subsidiaries in 25 European countries and worldwide. The European Headquarters are located in Berlin and Düsseldorf, Germany.

Manufactured and distributed worldwide, HACH systems are designed to simplify analysis by offering sophisticated on-line instrumentation, accurate field and laboratory equipment, high-quality prepared reagents, complete easy-to-follow methods, and life-time technical support. Special optimization solutions for water treatment facilities guarantee stable and most effective treatment processes.

Hungarian Water Cluster

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The founding objective of the Hungarian Water Cluster (established in 2008) was to bring together Hungarian water professionals and companies from the different areas of water industry to co-operate in foreign markets. The Cluster offers efficient, but affordable technologies and world-class expertise in the following water segments:

- WATER TREATMENT/WATER PURIFICATION
  - Water services
  - Network-operation
  - Mobile water purification
- WATER LOSS, NETWORK LOSS REDUCTION
- WATER AND DRAINAGE SYSTEMS
  - Trenchless technologies
- MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT
- RAINWATER TREATMENT
- WATER PROSPECTING - WELL DRILLING
- WATER BOTTLING
- FLOOD PREVENTION
  - Disaster recovery
- RESEARCH AND DEVELOPMENT

The members of the Cluster have decisive role in the leadership of the Hungarian (Hungarian Water Association, Hungarian Water Utility Association), and the international (EWA, ASEMWater) professional organizations. Our members are regular participants of the professionals' delegations accompanying the international meetings of the Hungarian Government.

IDEXX Laboratories, Inc.

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Description

IDEXX Laboratories, Inc. is a leader in pet healthcare innovation, serving practicing veterinarians around the world with a broad range of diagnostic and information technology-based products and services. IDEXX products enhance the ability of veterinarians to provide advanced medical care, improve staff efficiency and to build more economically successful practices. IDEXX is also a worldwide leader in providing livestock and poultry diagnostic tests and tests for the quality and safety of water and milk. Headquartered in Maine, IDEXX Laboratories employs more than 6,000 people and offers products to customers in more than 175 countries.

About IDEXX Water

IDEXX Water is a global provider of water testing solutions that deliver easy, rapid, accurate and cost-effective information on water quality to laboratories and public utilities around the world. IDEXX entered the water testing market in 1993 with Colilert®, now one of the most frequently used testing methods for the detection of coliforms and E. coli in water worldwide. More recently, IDEXX launched Pseudalert® for 24-hour detection of Pseudomonas aeruginosa in hospital water systems, pools, spas and bottled water. The Pseudalert® Test detects P. aeruginosa quickly to help safeguard against infections in sensitive populations. For more information, visit idexx.com/water® Registered trademark of IDEXX Laboratories

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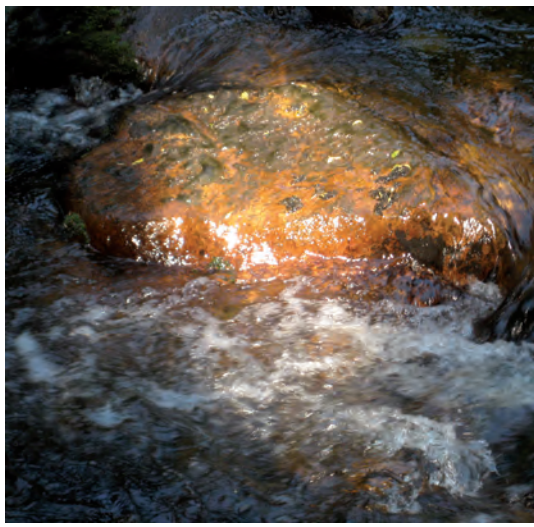
KOCKS CONSULT GMBH is an independent company of planners and consultants established in 1946 by Friedrich Kocks.

KOCKS ENGINEERS elaborate projects and offer their expertise in the fields of transport planning, urban and spatial planning, civil and structural engineering, facilities and equipment engineering, electrical engineering, water supply and disposal, environmental consulting and mechanical engineering. In close cooperation with the client, we develop, design and implement approvable customized comprehensive solutions tailored to each client's specific needs.

Today, about 200 engineers, technicians, scientists, economists and experts in various disciplines adjacent to construction sector provide high-quality services from currently eleven branch offices and construction sites in 30 countries worldwide.



Steinzeug-Keramo

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Description

Steinzeug-Keramo is Europe's largest manufacturer of vitrified clay pipes and fittings for sewer systems. It has production sites in 2 different countries (Germany and Belgium) on 3 different places (Frechen, Bad Schmiedeberg and Hasselt).

Since 2010, Steinzeug-Keramo is a subsidiary of the Wienerberger group, the world's biggest manufacturer of bricks and tiles. Steinzeug-Keramo has a workforce of roughly 530 employees and is active on multiple markets, such as Europe, the Middle and Far East, overseas, ...

At all manufacturing sites, production runs continuously, 24 hours a day, ensuring thus a worldwide distribution of top-quality, high-performance vitrified clay pipes and fittings. By implementing the latest processes and technology,

Steinzeug-Keramo complies with the requirements – such as the European EN 295 and ZP WN 295 norms – for manufacturing eco-friendly, sustainable products. Furthermore, Steinzeug-Keramo products are Cradle-to-Cradle® certified, implying that they are 100 percent recyclable.

Through its competent personnel, Steinzeug-Keramo offers proficient advice and construction advisory services worldwide.

Wasser Berlin International

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Description

Wasser Berlin International is Germany's specialized, international trade fair for water and waste water.

Wasser Berlin International is the only trade fair that presents the entire water cycle and offers products and services from all areas of the water industry. The high-profile congress and supporting programme with exhibition-related symposia is integrated into the exhibition halls and creates a logical link between theory and practice. The parallel hosted interactive public show WASsERLEBEN is geared towards the younger generation, who can learn more about theme of water as a resource.

Wasser Berlin International, the trade fair for water and waste water management is organized every two years by Messe Berlin. Berlin's central European location, especially its proximity to the growing eastern European market, offers exhibitors and trade visitors an effective and potentially very successful perspective. The next international trade fair and congress for Water Management will be taking place in Berlin on 26-28 March 2019.

Product Groups of Wasser Berlin International

- Water extraction
- Water treatment
- Water distribution
- Wastewater transport
- Sewage & waste water treatment
- Construction services / NO DIG
- Flood Management Berlin, Flood Protection
- IT Services
- Quality assurance / science /research
- Industrial water use
- Energy production
- Energy efficiency / Measuring, Regulating & Analysis Technology

Figures of Wasser Berlin International 2017:

Exhibitors: 449 from 23 countries

Trade visitors: 15.678

Gross exhibition area: 31,900 m²

Politecnico di Torino

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Description

The Politecnico di Torino (www.polito.it), descending from the Technical School for Engineers born in 1859, was founded in 1906. It is a centre of teaching and research excellence, and one of the most important universities in Europe for architecture and engineering studies, strongly committed to collaboration with industry. Politecnico di Torino offers diversified teaching: from Aerospace Engineering to Telecommunications, from Biomedics to Mechatronics, Environmental Engineering, Industrial Design, Automotive Engineering and Engineering for Cinema and Media Engineering, and a wide range of courses and specialization programs. Distance-learning programs are also available.

The internationalisation is one of the main aims of Politecnico. Over 89 international agreements allow students to obtain double degrees, and 2,000 foreign students per year are enrolled in different schools in the university, including PhD students. Six collaboration agreements with Chinese universities have recently been signed, and in the new buildings of the Tongji University of Shanghai (www.tongji.edu.cn) the Sino-Italian Campus has been inaugurated. New agreements have already been planned especially with Indian universities in the ICT sector.

Siemens AG

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Siemens AG is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization.

For the water and wastewater industry we have developed an integrated portfolio that covers the en-tire plant lifecycle from planning to maintenance. Key elements of our offer for integrated engineering and integrated operations are simulation and virtual commissioning (SIMIT), process control system (SIMATIC PCS 7), integrated plant lifecycle management (COMOS) and real-time operation intelligence (XHQ) as well as SCADA Systems. Our field instrumentation and gas analyzers provide reliable data of the processes, while industrial communication and power supplies enable a comprehensive infrastructure for the entire production process. As a trusted technology partner, Siemens offer com-prehensive services that help our customers overcome the challenges, today and in the future.

Tiroler Rohre

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Tiroler Rohre develops, manufactures and markets high-grade systems made from ductile cast iron for the transport of water. Furthermore, we manufacture general-purpose pile systems for deep-foundation engineering.

We employ a workforce of more than 200 people at our production facility in Hall in Tirol. Tiroler Rohre GmbH is one of Europe's largest suppliers of ductile cast-iron pipeline systems.

The sustainable properties of the ductile cast iron combined with innovative technologies and professional expertise in our customers' areas of application are what have made us a leading problem-solver in the water industry and foundation engineering.

Unie van Waterschappen (UvW)

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Description

The Unie van Waterschappen represents the interests of 23 water authorities (Waterschappen in Dutch). The water authorities are decentralised functional governments, responsible for regional water management (quantitative and qualitative), flood defence and waste water treatment.

Challinging topics for the future:

1. Facing the challenges of climate change with regard to regional water management.
2. Financing Integrated Water Resource Management.
3. Further strengthening the position of the Unie van Waterschappen Europe by Influencing relevant European legislation.

Association of Dutch Water Companies (Vewin)

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Description

Vewin is the national association representing Dutch water supply companies. Back in 1952 it was founded; more than 200 water supply companies were active in the Netherlands. Today there are 10, which is a change that has altered the association's essential task. Vewin focuses primarily on representing the interests of its members in The Hague and Brussels by creating an environment in which members are able to optimally achieve their objectives.

WILO SE

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Description

WILO SE – Ideas with the power to change the world

Globalisation, Urbanisation, Climate Change, Water Shortages, Technological Process & Energy Shortages:

These Megatrends play an important role in global progress.

The strength of Wilo is to understand markets in their multi-tiered overall context, which drives us to develop our intelligent solutions to move water.

As one of the world's leading innovators and manufacturers of pumps and pump systems, we face the challenges of the future.

Wupperverband

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Description

Being one of Germany's longest-serving water management corporations, the Wupperverband manages the catchment area of the river Wupper with respect to all water-management tasks since 1930. The catchment area comprises an area of 813 square kilometres with about 2300 kilometres of rivers and streams. More than 900000 inhabitants live in this area.

The Wupperverband is a corporation under public law. Its statutory tasks are sewage treatment and waste disposal, operation of dams to control the water flow in the River Wupper and other rivers, provision of drinking and process water, maintenance and restoration of the rivers and streams. The Wupperverband runs 11 sewage treatment plants, 56 kilometres of sewers, 71 storm-water tanks and sewage pumping stations and 14 dams.

The members of the Wupperverband are the cities and district towns, water supply companies and other companies in the catchment area.

Cooperation Organisations

ICOLD – International Commission on Large Dams European Club

International Committee on Large (ICOLD)
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Fax: +34 963 87 76 18
Email: iescuder@hma.upv.es
Web: http://cnpgb.apambiente.pt/IcoldClub/index.htm

President
Guido Mazzà, Vice-president of ITCOLD
e-mail: guido.mazza@rse-web.it

The International Commission on Large Dams (ICOLD) is a non-governmental International Organization which provides a forum for the exchange of knowledge and experience in dam engineering.

The Organization leads the profession in ensuring that dams are built safely, efficiently, economically, and without detrimental effects on the environment. Its original aim was to encourage advances in the planning, design, construction, operation, and maintenance of large dams and their associated civil works, by collecting and disseminating relevant information and by studying related technical questions.

Since the late sixties, focus was put on subjects of current concern such as dam safety, monitoring of performance, reanalysis of older dams and spillways, effects of ageing and environmental impact. More recently, new subjects include cost studies at the planning and construction stages, harnessing international rivers, information for the public at large, and financing.

ICOLD leads the profession in **setting standards and guidelines** to ensure that dams are built and operated safely, efficiently, economically, and are environmentally sustainable and socially equitable.

ICOLD wishes to be the world's leading professional organization, dedicated to advancing the art and science of dam engineering and promoting the wise and sustainable development and management of world's water and hydropower resources.

International Water Association (IWA)

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Executive Director
Dr. Ger Bergkamp

President
Glen Daigger

Formed in 1999 following the merger of the International Water Supply Association (IWSA) and the International Water Quality Association (IAWQ), today, IWA is the global reference for water professionals, spanning the continuum between research and practice and covering all facets of the water cycle. As a member driven organization with 10000 individual and over 500 corporate members worldwide, IWA is in a better position than any other organization to help water professionals find innovative, pragmatic and sustainable solutions to challenging global water needs. Through its network of members and experts in research, practice, regulation, consulting and manufacturing, IWA can create expanded knowledge and integrated solutions to meet these needs. Membership to IWA provides water professionals with a forum for collaboration across the boundaries of specialties, professionals and different parts of the world.

IWA seeks to be:

- The premier international network of water professionals drawing members from all disciplines in water science & practice
- An international authority on sustainability in the water sector, promoting innovation and best practice
- A highly valued partner to those organizations dedicated to achieving effective water management
- Provider of global leadership capable of meeting the dual challenges of environmentally sustainable water provision and the development of the plant.

Japan Sewage Works Association (JSWA)

Japan Sewage Works Association
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Starting in the latter half of the 1950s, rapid growth of industrial economy led to such social problems as aggravation of the living environment and water pollution in public water bodies. This was the situation when the Sewerage Division of the Japan Water Service Association and the National Sewage Works Development Conference were integrated to form the Japan Sewage Works Association in April 1964. JSWA got permission to establish itself as a public interest corporation in January 1965 and began full-scale activities with public organisations as regular members.

The Association's objectives are to develop sewerage services soundly, while conducting research on sewerage systems, and to preserve a network public water bodies for the improvement of people's lives. As a network organisation of bodies involved in sewage works, JWSA carries out a wide range of activities to promote development of sewage works, and facilitates communication and cooperation between public organisations implementing and planning sewage works on the one hand, and National government, related organisations, enterprises and civic groups on the other.

JSWA has 1,509 organisations implementing or planning sewage works as regular members, 54 as associate members, 1,052 enterprises as supporting members, 435 as individual members and 8 honorary members, for a total of 3,058 organisations and individuals as of January 1, 2012.

Chartered Institution of Water and Environmental Managament

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Angela Grey

Executive Director
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Activities

CIWEM is a professional institution with thousands of members many of them based overseas across 90 countries. CIWEM members work for regulators, government, consultancies, international organizations (such as World Bank, ADB) etc. The institution develops it's activities and thinking through technical panels which include: Water Resources; Water Supply and Quality; Air; Wastewater Management; Waste Management and Sustainability & Environmental Management. In addition CIWEM operates groups, Rivers & Coastal; WaPug – CIWEM Urban Drainage Group and a range of networks: Natural Capital; Faiths and Environment ; Climate Change; Contaminated Land; Arts and Environment;

CIWEM also produces two major journals Water & Environment Journal (WEJ) - http://www.ciwem.org/publications/journal/ and the online Journal of Flood Risk Management - http://www.ciwem.org/publications/flood/.

ASEM – Water Resources Research and Development Center

Chairperson
Mr Liu Yanhua; CN

Vice Chair among others:
Károly Kovács, HU

Secretariat of the association
No. 233 Yuelu Avenue
Hunan Science and Technology building
Changsha City, Hunan Province
P.R. China
http://www.asemwater.org/

Activities

As one of the fundamental natural resources and strategic economic resources, as well as a controlling element influencing eco-environment, water is vital for human survival and sustainable socio-economic development. Sustainable use and integrated management of water resources also play a key role in addressing global climate change. With rapid development of world economy, negative factors such as population growth, eco-environment deterioration and ill-management, have further exacerbated the crisis of fresh water. Thus in the face of common challenges, Asian-European countries have to effectively solve problems of water supply, drought, floods, soil erosion, and water pollution etc., accelerate the progress of sustainable water use and integrated management, and promote the exploration and demonstration of water-saving technologies.

Water Environment Federation (WEF)

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Founded in 1928, the Water Environment Federation (WEF) is a not-for-profit technical and educational organization of 33,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. WEF members, Member Associations, and staff proudly work to achieve our mission to provide bold leadership, champion innovation, connect water professionals, and leverage knowledge to support clean and safe water worldwide.

WEF and its global network of members and Member Associations (MAs) provide water quality professionals around the world with the latest in water quality education, training, and business opportunities. WEF's diverse membership includes scientists, engineers, regulators, academics, utility managers, plant operators, and other professionals. WEF uses this collective knowledge to further a shared goal of improving water quality around the world.

Together, WEF and its members work toward fulfilling three critical objectives:

- Drive innovation in the water sector
- Enrich the expertise of global water professionals
- Increase awareness of the value of water

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Simple assembly

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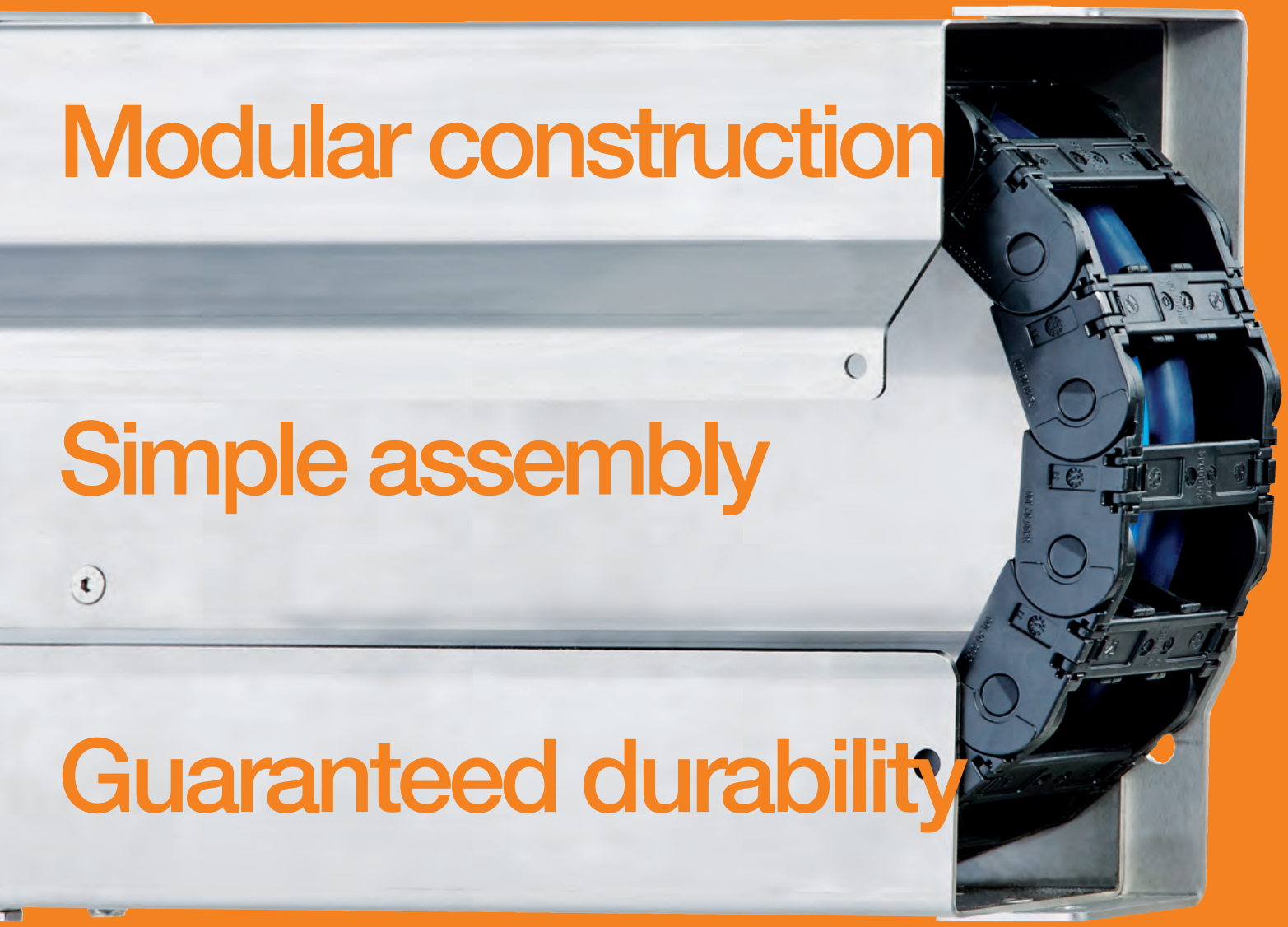

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igus®.eu/sewage-plant
plastics for longer life®

WATER
MEETS TECHNOLOGY

WASSER BERLIN INTERNATIONAL

Trade Fair and Congress for Water Management

26 – 28 March 2019

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