

New association supports European water reuse industry

Water Reuse Europe (WRE) says that the global water reuse sector will grow 20 percent each year for the next 3 years. To ensure that the sector delivers innovative and safe water reuse solutions, the association aims to be a one-stop resource for commercial companies and public organizations that are involved with reusing water.

In this interview with *World Water: Water Reuse & Desalination*, WRE Chairman and Acting CEO **Paul Jeffrey** elaborates on the growing regional demand for water reuse, barriers to acceptance, economic viability, and the role played by WRE, launched in October 2016, to unify the water reuse sector in Europe.

Water Reuse & Desalination — What pressures are driving the demand for water reuse in Europe?

Paul Jeffrey — Although urban and industrial water demands have to some extent plateaued over recent years, demand for irrigation water has continued to rise. Forecasts suggest that the following decades will see both a reduction in water availability in many parts of Europe driven by climate change, and renewed pressures on demand from urban growth. Within this context, it is unsurprising that the European Innovation Partnership (EIP) has identified water reuse as a top priority in the battle to ensure integrated and sustainable management of water resources across the continent. Unsurprisingly, an increasing number of European countries are embedding water reuse in their water management strategies and starting to invest in innovative solutions for the treatment of wastewater for a range of reuse applications. These include recycling for non-potable purposes in agriculture, municipal, and industry contexts but also for indirect potable applications.

The European water reuse sector has been relatively slow to respond to the opportunities provided by the widening gap in the supply-demand balance. Although the scarcity of Europe-wide legislation and regulation is often suggested as the primary reason for this, it's arguable that a number of challenges have been at play including limited awareness of the multiple benefits of reuse schemes, low economic attractiveness of proposed solutions, and a lack of cohesion between professionals from the public and private sectors involved in the development and implementation of water reuse schemes.

WR&D — What role does WRE play in expanding the water reuse and recycling market in Europe?

Jeffrey — WRE has been established to help address some of these challenges by providing both a collective identity for the European water reuse sector and a focal point for nurturing

innovation, knowledge sharing, and best practice. Set up with support from the European Union through the DEMOWARE initiative, the association is now an independent not-for-profit company registered in the United Kingdom.

WRE represents the European water reuse sector's interests, views, and aspirations and stimulates the growth and competitiveness of the sector through a range of initiatives. We support our members by facilitating the sharing of knowledge, good practices, techniques, research, and experiences as well as by promoting European expertise and solutions in water reuse to global markets. Finally, our outreach program will raise public awareness and understanding of water reuse practices and promote the safe and effective use of recycled water.

WR&D — What is the potential for municipal water reuse in Europe? Is industrial water reuse and recycling being adopted more quickly than municipal reuse?

Jeffrey — A formal integrated analysis of the potential for water reuse across Europe has not been conducted since 2006, and one of WRE's first tasks is to update this study to provide our members and others with better intelligence of the market potential across the industrial, municipal, and agricultural sectors.

Worldwide, the most common use for recycled water is agricultural irrigation, and this is no exception in Europe where Spain is a global leader in the field. In 2008, the Spanish Ministry of the Environment reported a reclaimed water production of nearly 450 million cubic meters with 71 percent being used for agricultural purposes. A prominent example of Spain's commitment to reuse can be found in the Murcia region where a scheme treating approximately 110 million cubic meters of urban and industrial wastewater annually allows environmental restoration of the Segura River while providing 100 million cubic meters of tertiary treated wastewater for agricultural irrigation.

Water Reuse Europe Chairman and Acting CEO Paul Jeffrey is also the Professor of Water Management at Cranfield University, Head of the Cranfield Water Science Institute, and Director of the STREAM Industrial Doctorate Centre.

Professor Jeffrey, also a Fellow of the Institution of Civil Engineers, has research interests that encompass the development of sustainable water use arrangements and the relationships between human, natural, and technological dimensions of water management. He has worked on water reuse issues for more than 20 years, supporting utilities, regulators, and technology providers. Professor Jeffrey has contributed more than 100 journal and conference publications in the fields of water resources management, science and society, technology assessment, social justice, and complex systems.

Water reclamation for industrial purposes is also on the rise across Europe. Notable examples here include the use of advanced filtration technologies at a food processing plant in Belgium, resulting in a 50-percent reduction in the company's groundwater requirements, and a treatment solution involving ultrafiltration and electro dialysis in the paper industry in Italy, which reduces fresh water demand by 67 percent.

Water recycling for drinking water augmentation remains a marginal activity in Europe although Belgium is home to one of the most recognized water reclamation schemes for indirect potable reuse at Torreele, where the use of reclaimed water for aquifer recharge increases the drinking production capacity of the site especially during periods of high demand in summer. In 2015, 42.9 percent of the utility's annual drinking water supply was sourced from the reuse/recharge site.

WR&D — Investors and water utilities are excited about water reuse; however, Europe's water sector's ability to deliver projects is hindered by the lack of regulation, technology skills, and public acceptance, according to a 2013 report by the Water Supply and Sanitation Technology Platform (WssTP). How can the Water Reuse Association help to remove these barriers?

Jeffrey — As a central point of reference for the water reuse sector, WRE acts as a broker for industry contributions. By assembling and summarizing evidence and opinion from our members, we can play an important role in shaping legislation and standards, identifying knowledge and competency gaps, and widening understanding about reuse practices. Experiences in water reuse have arguably been fractured and poorly harmonized at the European level. WRE won't solve that problem overnight, but it does, for the first time, provide an environment within which improved coordination and mutually beneficial exchanges can take place.

WR&D — What strategies would you recommend for increasing public understanding and acceptance of water reuse?

Jeffrey — Interestingly, we are seeing a maturing of public responses to all forms of resource reuse across European communities characterized by more informed debates and greater willingness to engage positively with reuse schemes at design and planning stages. Awareness raising and education around water resource management challenges offer important starting points for conversations about the benefits of reuse. At the project level, there's more work to be done on the development of tools to help us better understand the variety of sources of objection that are encountered and how these are influenced by pre-conceptions and information. WRE sees improved understanding of the science behind water reuse as a major objective for its outreach activities, whether that be with citizens, professionals from allied sectors, or those in government.

WR&D — What countries would you consider prime examples of offering guidance in developing water reuse quality standards?

Jeffrey — The USA, Singapore, and Australia have been the leading lights in the development of water reuse legislation and water quality standards. It is no coincidence that those countries with the largest markets for reuse schemes and the most organized sectors also have the longest history of supportive legislation and guidelines. Although several EU-member states have well-established water reuse regulations (e.g. Spain and Cyprus), the development of a unified position at the European level has been slow and limited to guidelines and reference documents (many in the context of the Water Framework Directive). However, the pace is quickening with the EU's Joint Research Centre currently working on the development of minimum quality requirements for water reuse in agricultural irrigation and aquifer recharge.



WR&D — How can the long-term economic viability of water reuse projects be managed to make it more attractive for investors and consumers?

Jeffrey — The long-term economic viability of a reuse scheme is intrinsically linked to the adopted business model, which shapes the distribution of costs, risks, and benefits among stakeholders. Europe has extensive experience of how to beneficially structure and sustain such multi-stakeholder investments in other industrial sectors (often catalyzed by circular economy initiatives) and is applying these lessons to reuse schemes. Interestingly, many of these financing solutions are associated with collective governance arrangements, which broaden involvement in scheme management and operation.

WR&D — In many countries, different parts of the water cycle -- water, wastewater, stormwater, watershed -- are managed by separate authorities that can impede the progress of a water reuse project. In contrast, integrated, sustainable water management can bridge the gaps between these water resources, making water reuse less costly and more quickly implemented. Could you elaborate on the challenges in Europe of facilitating change in governance to enable water reuse projects to go forward?

Jeffrey — In Europe, the Water Framework Directive (WFD) provides a valuable reference point for integrating water management across multiple functions and remits. The directive places requirements on EU national governments to achieve a particular outcome but leaves it up to member states to determine how the measure is to be accomplished. As a form of "soft power" to influence things like environmental water quality and stakeholder engagement, the WFD has been arguably very successful, and encouragement for reuse is to be found in its provisions. "Daughter" directives (e.g. on groundwater and hazardous substances) are often used to extend the scope and firm up the requirements imposed by the WFD. A daughter directive on non-potable water quality standards or one that spoke to governance arrangements for reuse schemes would be welcome.

WR&D — What are the overarching goals of the Water Reuse Europe association? What is the association's primary focus in its first year?

Jeffrey — The overarching goals of WRE are to become the collective identity for the European water reuse sector and to promote an innovative and dynamic industry. Our focus for 2017 is to build the membership base, expand the range of services we provide for our affiliates, and build productive relationships with similar associations in other parts of the world. Our first few months of operation have been both exciting and encouraging. Current membership includes SME's, large multinationals, and a variety of public bodies, all of which have placed trust in us to help shape the future of water reuse across the continent. We hope to welcome both them and many others to our first conference and exhibition, which will take place in Bruges, Belgium, on the 9th and 10th of October later this year.

WR&D — Finally, what do you consider the most important steps that must be taken to significantly increase water reuse throughout Europe?

Jeffrey — Despite the obvious benefits associated with water reuse, several regulatory, social, and economic challenges remain to be addressed before more widespread implementation of water reuse schemes in Europe will be possible. For instance, while some European countries such as Spain have developed their own regulations for water reuse that stimulate the implementation of schemes, many European states do not yet have such supportive regulation. Further efforts are also required to better explain the benefits of reusing water in order to stimulate public, commercial, and government enthusiasm for water reuse. This will not only favor the implementation of new projects but will also support the development of financial incentives for reuse schemes. Indeed, effective business models are a critical element of successful water reuse projects. Finally, although many innovative treatment technologies for water reuse have been developed and implemented worldwide, more consistent methods are needed to select technologies adapted to specific reuse applications.

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