Editorial: Environmental technologies for the sustainable development of the water and energy sectors

Do you know that watching your favourite series on TV requires indirect water consumption? In fact, every time we use energy resources, we also consume water. In the next few decades, global water and energy demand will increase significantly. Even though changing water demand and supply is unavoidable, there is little existing information on the expected global changes. An analysis by the Water Research Institute (WRI) attempts to reveal global water stress situations by categorizing the leading water-stressed nations by 2040 (Maddock *et al.* 2015). WRI uses a set of climate change models and socioeconomic parameters to score and rank future water stress conditions in 167 countries between 2020 and 2040. This study revealed that around 33 countries will experience very high water stress by 2040.

As water scarcity rises due to rapid population growth, climate change and water quality deterioration, the global demand for pure water increases. In order to face these environmental and societal challenges, sustainable innovative technologies are needed to ensure global resilient water supply and reduced pollution in line with the concept of a Circular Economy (Olsson 2015).

Recently, there has been a significant growth on the need for developing emerging and innovative environmental technologies to ensure the sustainability of the water sector (Naddeo *et al.* 2020). Examples include wastewater treatment processes, greenhouse gas emission and control, energy production and storage, and recovery of valuable resources from wastes.

In this issue of *Water Science & Technology*, ten papers resulting from the 2nd Water and Energy Nexus conference (http://waterenergynexus.org/) were selected from multiple disciplines which focused on the state-of-the-art of novel technologies in the field of environmental applications.

Firstly, Chiavola *et al.* (2020) compared the technical-economic aspects of chemical precipitation and ion exchange processes for the removal of phosphorus from wastewater. Secondly, Ullah & Zeshan (2020) investigated the effect of different substrates and concentrations on the performance of double chamber microbial fuel cell. Thirdly, Boguniewicz-Zablocka *et al.* (2020) carried out a study investigating the impact of pre-treatment on the removal chemical oxygen demand (COD) from paper industry wastewater. Fourthly, Alkindy *et al.* (2020) focused on the synthesis of polyethersulfone (PES)/GO-SiO_2 Mixed Matrix Membranes which can be used for oil-water separation. Fifthly, Giberti *et al.* (2020) used a dual layer reaction settling model for the prediction of wastewater treatment plant performance during aeration demand. Sixthly, Mobilia & Longobardi (2020) studied the impact of rainfall properties on the performance of hydrological models for green roofs. Seventhly, Schäfer (2020) demonstrated the short-term flexibility for energy grids provided by wastewater treatment plants. Eighthly, Mosalam & El-Barad (2020) designed an integrated platform between water energy nexus and business model which can applied for sustainable development. Ninthly, Bergamo *et al.* (2020) compared long shafted paddle mixing with gas mixing in an anaerobic digester. Lastly, Imani & Hajializadeh (2020) conducted a study towards the resilience-informed decision making in critical infrastructure networks.

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