

Green transition in wastewater treatment plants - challenges and opportunities

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Abstract

Green Deal (GD) concept is based on sustainable development (SD) principles, that underline necessity for integration of economic, social and environmental aspects in any human activity, as a way to green economy. In Europe, GD has been indicated in general strategy for economic development in 2019, as the European Green Deal. It aims to achieve climate neutrality on continent until 2025. To achieve this ambitious goal it is necessary to take appropriate actions in various sectors, including water and waste water sector. This paper presents comprehensive analysis of initiatives taken by operators of wastewater treatment plants (WWTPs) in green transition process. WWTPs show several opportunities to be “resources hubs” or “WWTPs of the future”, as recovery of raw materials, energy or water. Scope of paper include detailed analysis of various aspects of economic activity: political and law, socioeconomic, technological and environmental. An initial results have been discussed with group of experts to verify proposed driving forces and obstacles for further greening of WWTPs. The main driving forces are supportive European policy, legal recommendations in the area of water, raw materials and energy recovery, eco-trends and society's pressure on resource protection, several financial opportunities (including Horizon Europe programme) for investments in green and circular solutions. The key barriers include unharmonized legal regulations in various European countries regarding, lack of own resources for new investments and operation, inadequate competences in the area of green management and circular technologies. Our results could be significant for further development of sustainable and circular business models in WWTPs, to support strategic management process. Further research is needed and strong collaboration with WWTP's operators to understand their needs and possible pathways to change.

Keywords: green transition, circular economy; water; wastewater; wastewater treatment plant

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