



SENIOR WATER ENGINEER AT EUROPEAN INVESTMENT BANK

# JUAN BOFILL

“WWTPs are not the producers of micropollutants but rather the opposite, can be the solution”

**Microplastics and micropollutants are a hazard to human and environmental health. The European Investment Bank is looking for solutions to mitigate the impact of these emerging contaminants through financing or technical assistance, in line with its sustainability objectives.**  CRISTINA NOVO PÉREZ

A new report by the European Investment Bank (EIB), *Microplastics and micropollutants in water: emerging concerns*, looks into these contaminants of emerging concern and explores possible solutions which are already in the market, but due to some market failures are not yet fully implemented. Juan Bofill, Senior Water Engineer at European Investment Bank, author of the report, answers our questions on different approaches to reduce microplastics and micropollutants in water bodies.

**Can you tell us briefly about your career path and your current role at the European Investment Bank?**

I am a chartered civil engineer and I have been working at the European In-

vestment Bank for almost seven years, in the Water Management Division of the Environment and Natural Resources Directorate, which is part of the Projects Directorate. At the European Investment Bank, and the Climate Bank of the European Union, I work on the appraisal and monitoring of water projects. I provide technical assistance and cooperate with other institutions. I also deal daily with technical issues affecting the projects that we support with our clients and our beneficiaries.

The EIB aims to generate a positive economic, social, and environmental impact on society. Its financing tackles market failures by reducing investment gaps, in line with the Bank's public policy goals and its climate action and environmental sustainability objectives. The water sector plays an important role in achieving these objectives, so I am very pleased to be able to contribute to them. During my previous 18 years of experience, I worked in the private sector which is a crucial ally for public financiers like the EIB to reach the global climate and sustainable development goals.

**"The private sector is a crucial ally for public financiers like the EIB to reach the global climate and sustainable development goals"**

**How did the idea of preparing the report *Microplastics and micropollutants in water: emerging concerns* arise?**

Both microplastics and micropollutants are known as “contaminants of emerging concern” (CEC). At the EIB, we are constantly looking for solutions to address technical problems after we identified them, through financing or technical assistance. Thanks to its technical expertise, the Project Directorate of the EIB allows the Bank to understand different issues and to offer solutions to mitigate them. Microplastics caught our attention for some time as they are significantly threatening our health, the environment and biodiversity. Microplastics are tiny solid plastic particles smaller than five millimetres. According to a recent estimate, a person who eats seafood will swallow, on average, 11 000 pieces of microplastics every year. This risk is more and more known by the media and the general public. More than 80% of EU citizens are concerned about the impact of microplastics on their health and on the environment. For me as a water engineer at the EIB, I was very concerned by the fact that more than 96% of the 1.5 million tonnes of microplastics are discharged yearly to the oceans by water pathways, similar to micropollutants. This report was written with the aim to flag these problems and explore possible solutions which are already in the market, but due to some market failures are not yet fully implemented.

**Can you comment on the relative need, effectiveness, and cost of measures that tackle the production of microplastics versus “end-of-pipe” solutions?**

Upstream solutions are a complex problem. Plastic is a very useful material, and according to some studies (e.g. Breaking the Plastic Wave), the prediction is that the volume of plastic on the market will double in 2040 when com-





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pared to 2016. Most microplastics are produced as degradation or abrasion of bigger plastics, so unfortunately the problem is expected to grow. The so-called “intentionally added microplastics” in personal care products are already regulated by a proposal from the EC dated August 2022. But this is a tiny portion of microplastic pollution. Most of this pollution comes from tyre abrasion, clothing and city dust. Upstream solutions would require a combination of more sustainable behaviours, innovation and policy enforcement. End-of-pipe solutions are a reality. Wastewater treatment plants (WWTPs) are active barriers against these contaminants. Effective stormwater management can also contribute significantly. However, more research is required to solve the final fate of these microplastics that can end up in the environment if sewage sludge from WWTPs is used as fertilizer.

**“The EU directives on drinking water and urban wastewater treatment are key to achieve the 30% microplastic reduction target by 2030”**

**Can you tell us about recent and expected developments in European policy to address microplastic pollution through monitoring and mitigation in freshwater systems, and improvements in wastewater management?**

This issue is more and more present in European policy discussions. For instance, the *EU Zero Pollution Action Plan* approved in 2021 and a key deliverable of the European Green Deal contains a target of reducing microplastic pollution by 30% by 2030. Two key pieces of legislation to achieve this target are the new Drinking Water Directive, applicable already today, and the recently proposed revision of the Urban Wastewater Treatment Directive, which calls for improved stormwater management and expands the scope of the Directive to the collection and treatment of wastewater to smaller agglomerations (the threshold size is lowered from 2,000 population equivalent to 1,000 population equivalent). If adopted by 2025, will lead to further monitoring and reduction in microplastic discharge into water bodies.

According to the report, in most EU Member States, WWTPs are the biggest pathway for micropollutants to enter water bodies. Could you discuss some

**of the challenges with removing micropollutants from treated wastewater?**

WWTPs can be considered the biggest pathways for micropollutants because these are the end point of the collection of wastewater in urban areas, collecting these pollutants like chemicals and pharmaceuticals from houses, industries or hospitals. Therefore, WWTPs are not the producers of these micropollutants but rather the opposite. These facilities can be the solution. However, regular WWTPs are usually designed to eliminate macro-pollutants and do not fully remove

Wastewater Treatment Plant Juan Diaz in Panama financed by the European Investment Bank.





micropollutants from treated wastewater. Additional treatments so called “fourth steps” or “quaternary treatments” need to be added.

**To what extent do you think advanced treatments (fourth step or quaternary treatment) will be implemented in Europe to remove micropollutants in the next 10 to 20 years?**

The proposal for a revised Urban Wastewater Treatment Directive already provides for this advanced treatment. The proposal requires large wastewater treatment plants (defined

as having a capacity of at least 100 000 person equivalents) to add a fourth treatment stage to the wastewater treatment process by 2030 at the latest. This requirement would also apply to wastewater treatment plants with a capacity of at least 10 000 person equivalents that discharge effluent into water bodies that are classified as “being at risk”. The goal for this so-called fourth step or quaternary treatment would remove at least 80% of certain micropollutants. Of course, this would require a significant financial effort. Some studies value the addition of the

quaternary treatment to between €70 per capita and €95 per capita, depending on the selected technology. I am not sure how the wastewater sector will react to this cost increase and if finally the proposal will be approved in these terms. However, my personal opinion is that indeed additional treatments will be implemented to address these contaminants of emerging concern. Though the extent is uncertain.

**How does the EIB plan to support the development of approaches to reduce microplastics and micropollutants in water across the world?**

As a public institution, the EIB plays an important role to help overcome investment barriers and ensure that the projects it finances are the most suitable to address market failures and alleviate investment gaps. At present, the wastewater utilities do not have significant incentives to invest in facilities that would reduce the release of microplastics or micropollutants into the environment, as the benefits of these investments can hardly be captured in the form of higher tariffs. To address this market failure, the EIB provides long-term financing to water utilities, water resource managers and industrial wastewater users. In addition, the Bank may support project preparation and implementation through dedicated technical assistance. The pollution reduction of these contaminants of emerging concern is specifically mentioned in the recently published EIB Water Sector Orientation.

**“Regular WWTs are usually designed to eliminate macropollutants and do not fully remove micropollutants from treated wastewater”**

