December 2024

Facing the PFAS Issue

Views from the European Water Sector

Water Europe (WE) is the recognized voice and promotor of water-related innovation, research, and technology development in Europe. WE is a purpose-driven multi-stakeholder association with over 270 members, representing the entire range of actors in the innovative water ecosystem. WE was established by the European Commission as a European Technology Platform. WE is guided in all its activities by its Water Vision, with the ultimate ambition of achieving a Water-Smart Society.

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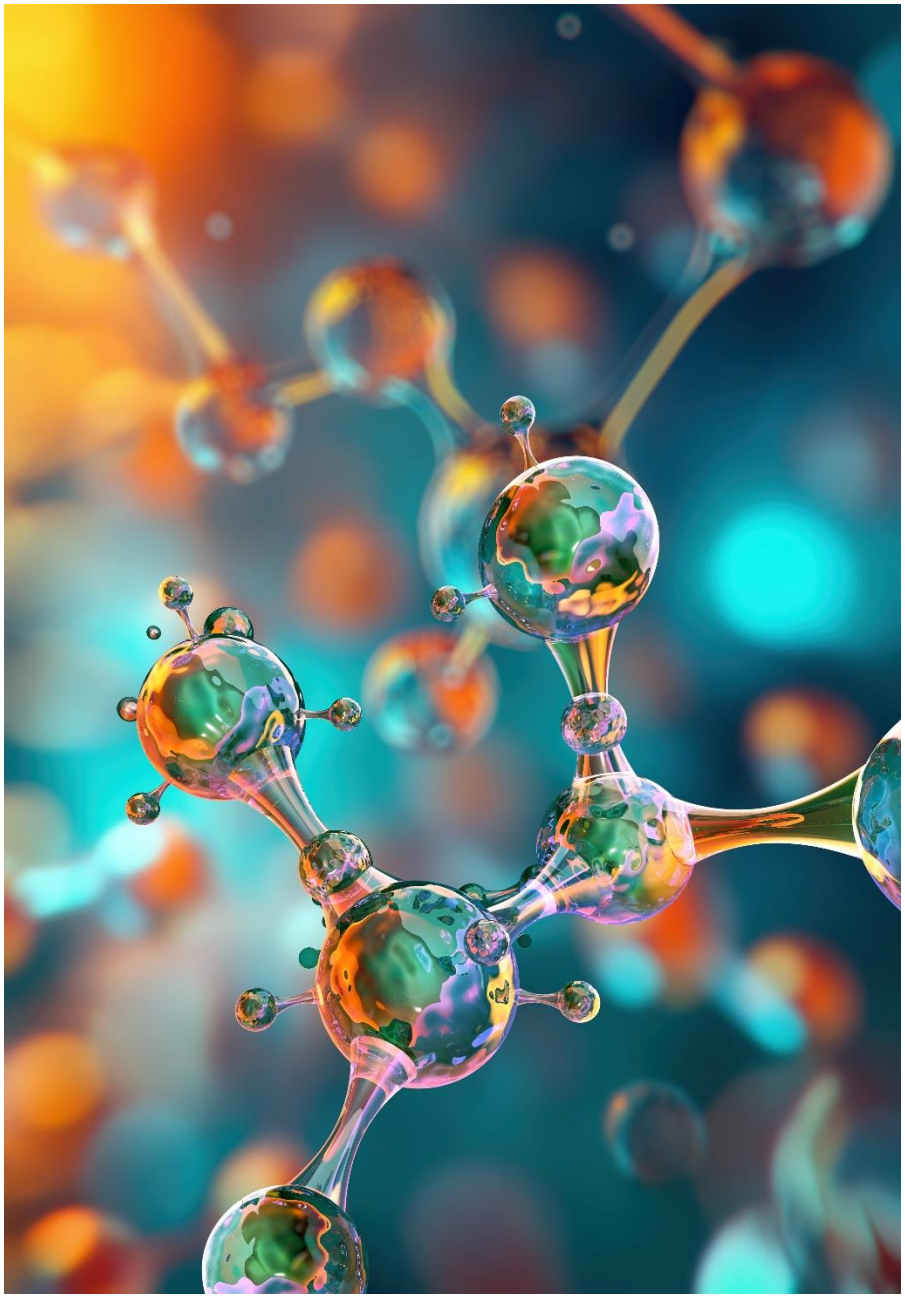
POLICY RELATED PAPER



Table

Facing the PFAS Issue

VIEW OF THE EUROPEAN WATER SECTOR

Per- and polyfluoroalkyl substances (PFAS) are a large family of thousands of synthetic chemicals that have been widely used in numerous industrial applications and consumer products since the 1940s. These compounds are characterized by their strong carbon-fluorine bonds, which make them highly resistant to degradation and give them unique properties such as water and oil repellence, heat resistance, and chemical stability.

With the objective to build a Water-Smart Society, Water Europe considers that the future lies in transitioning to solutions which are free of toxic PFAS, enhancing water safety and sustainability while minimizing socio-economic and ecological burdens.

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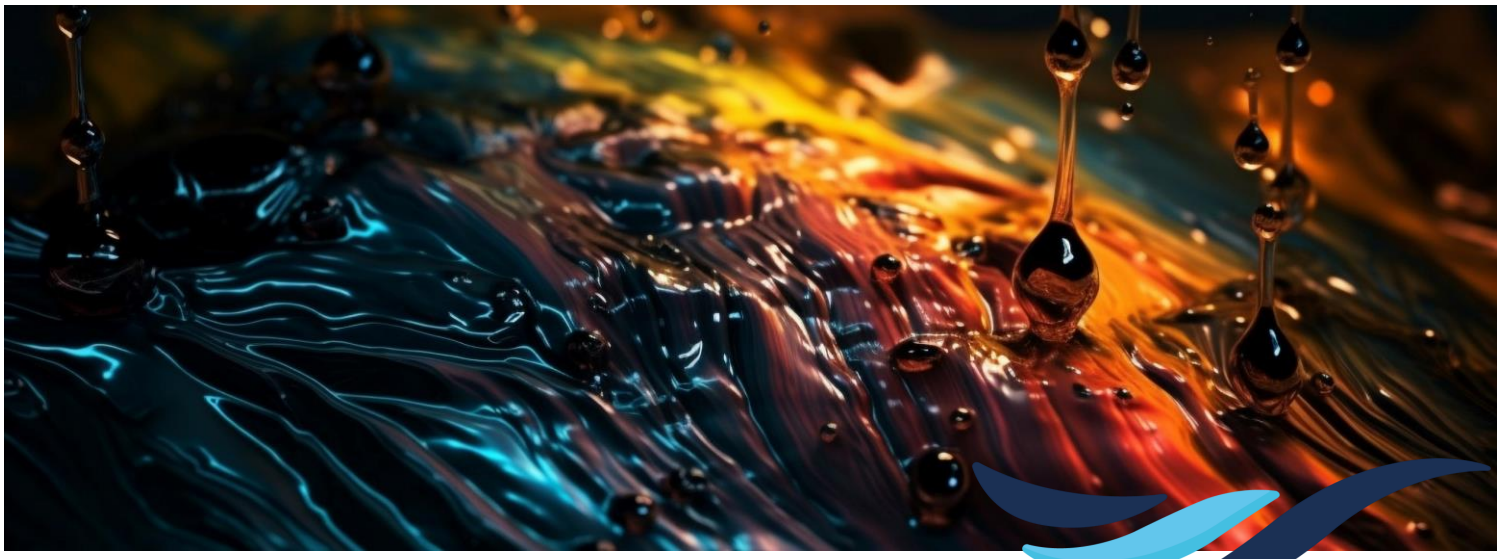

Introduction

Per- and polyfluoroalkyl substances (PFAS) are a large family of thousands of synthetic chemicals that have been widely used in numerous industrial applications and consumer products since the 1940s. These compounds are characterized by their strong carbon-fluorine bonds, which make them highly resistant to degradation and give them unique properties such as water and oil repellence, heat resistance, and chemical stability.

PFAS compounds raise particular concern due to:

- **Ubiquity:** PFAS are highly mobile chemicals that resist degradation in the environment (thus the phrase "forever chemicals") and accumulate in ecosystems and the food chain. Additionally, PFAS are formed as degradation product from other compounds in the environment.

- **Health:** The European Human Biomonitoring Initiative (HBM4EU) reported in 2022 that certain PFAS were detected in 99% of analysed blood samples from European adults and children[1]. The toxicity for reproduction of certain PFAS has been gradually established and in 2008 the European Food Safety Authority (EFSA) published its first risk assessment on PFOS and PFOA, with updates in 2018 and 2020 [2] . The first risk assessment concluded that certain PFAS are suspected to cause cancer or interfere with the human endocrine system.

- **Diversity:** the whole PFAS universe includes more than 1000 substances with differences in terms of risk, concern and replaceability. Also from the water sector's point of view all actions including regulation should be balanced with the need for certain essential uses of low concern substances.

- **Challenges in removal:** Commonly used drinking water and wastewater treatment processes are not cost-effective in eliminating these compounds. In countries establishing PFAS thresholds for drinking water, the processes used for PFAS removal are activated carbon filtration, Ion exchange resins, or membranes such as Reverse osmosis or Nanofiltration.

- **Challenge in destruction:** PFAS treatment technologies in water and wastewater management will generate concentrated waste abundant in PFAS (e.g. used activated carbon, ion-exchange resin, retentate, foam) that need to be treated i.e. destroyed or irreversibly converted (EU Regulation 2019/1021 on persistent organic pollutants). New elimination technologies are under development and there is a lack of capacity to treat these concentrates nowadays.

The value of PFAS in water management is complex and multifaceted. Some PFAS pose risks to health and the environment, particularly for drinking water management. However, some remain the only option in various applications, such as membrane technologies and coatings.

With the objective to build a Water-Smart Society[3], Water Europe considers that the future lies in transitioning to solutions which are free of toxic PFAS, enhancing water safety and sustainability while minimizing socio-economic and ecological burdens.

[1] HBM4EU. (2022). Policy Brief: Per- and Polyfluoroalkyl Substances (PFAS)
[2] EFSA. (2020). Risk to human health related to the presence of perfluoroalkyl substances in food.

[3] Water Europe, Water Vision, 2023

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Tackling PFAS in Europe's waters

European authorities are addressing the PFAS issue in various ways:

1. **Drinking water:** The European Union has revised the Drinking Water Directive (EU) 2020/2184, which came into force in January 2021. This directive sets a limit value of 0.1 µg/L for the sum of 20 PFAS compounds and 0.5 µg/L for PFAS Total (all PFAS) in drinking water. Member states are required to ensure compliance with these standards by 2026.

2. **Wastewater treatment:** The new Wastewater Treatment Directive includes monitoring requirements for PFAS in urban wastewater treatment plant effluents[4].

3. **Water Framework Directive:** The EU is considering the inclusion of certain PFAS compounds in the list of priority substances under the WFD, for MS to monitor their water bodies and take measures to reduce the presence of such PFAS[5]. The Council proposed setting environmental quality standards for the sum of 24 PFAS in inland transitional and costal surface water as well as groundwater[6].

4. **REACH and Persistent Organic Pollutants Regulations:** several PFAS compounds, including PFOA, PFOS, PFHxS, PFHxA, PFAS with 9 to 14 carbon atoms are restricted or are in the process of being restricted[7].

5. **Future actions:** The EU Chemical Strategy for Sustainability aims to ban the most harmful chemicals in consumer products, including PFAS, allowing their use only where essential[8]. The **PFAS Action Plan** operationalizes the Chemical Strategy specifically for PFAS.

In 2023, ECHA published a document titled "**Defining criteria for essential uses of PFASs**", with a three-step assessment:

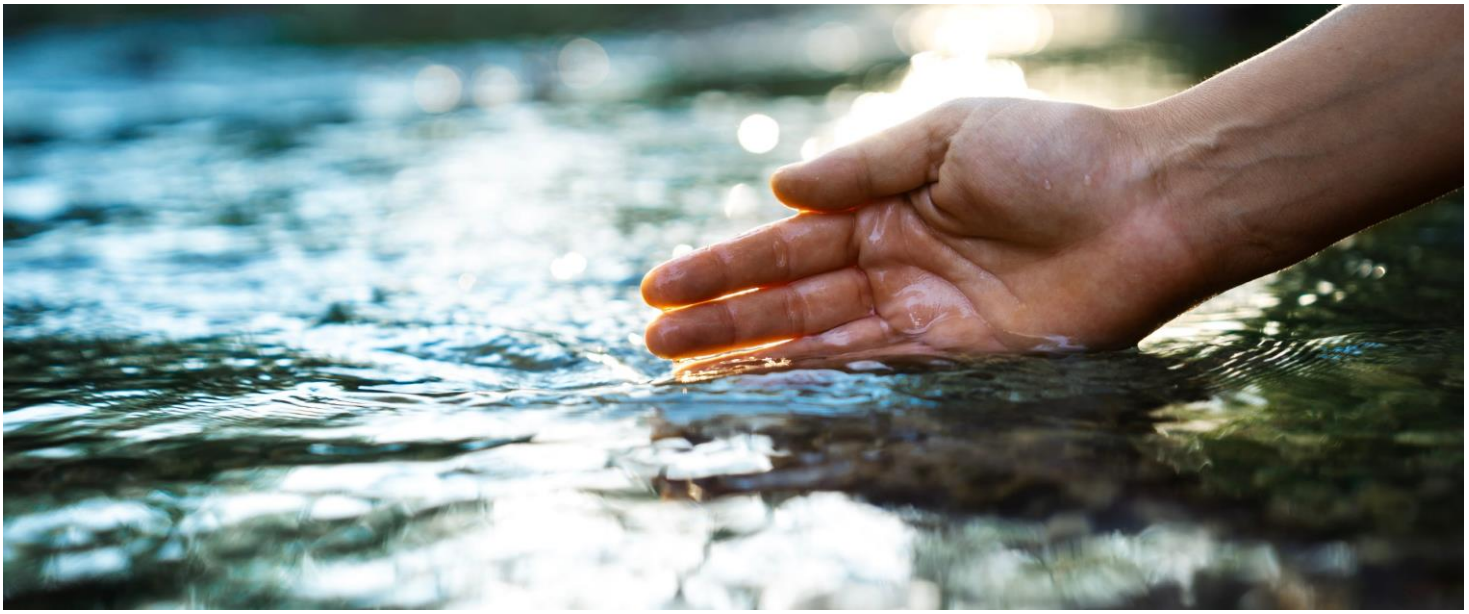
a) Is the use necessary for health, safety, or critical for the functioning of society?
b) Are there alternatives available?
c) Is the use of PFAS the least harmful option?

Acting now and in the future

Water companies have carried out exploratory campaigns on PFAS, with targeted or horizontal strategies. They measured PFAS concentration in their drinking water production sites, and informed communities, authorities and health agencies of the findings, showing that the strong majority of sites comply with EU standards. These exploratory campaigns confirm the existence of PFAS contamination (in ground- and/or surface water) at locations in proximity to expected PFAS emitting sources (typically airports, places where fire-fighting foams have been used, PFAS production sites), but have also identified sites without obvious pollution sources. In addition, PFAS are also identified in landfill leachates.

As a first duty, local authorities under their Member States health authorities start deploying water and wastewater treatment where the protection of the environment and health so requires, tapping in the experience and R&D results of water companies.

4. European Parliament legislative resolution of 10 April 2024 on the proposal for a directive of the European Parliament and of the Council concerning urban wastewater treatment (recast) (COM(2022)0541 – C9-0363/2022 – 2022/0345(COD))
5. EC (2022). Review of the Water Framework Directive
6. Council, Surface water and groundwater: Council agrees negotiating mandate to update list of pollutants, press release, 19 June 2024
7. ECHA. (2023). Perfluoroalkyl chemicals (PFAS)
8. EC. (2020). Chemicals Strategy for Sustainability. See also amendment of Annex XVII to The REACH Regulation of 19/9/2024.



Recommendation

For the future, we formulate recommendations to ensure a healthy environment, improve the protection of EU citizens, and enable the EU to prosper, guarantee a high-level of water services in terms of security, safety and with a reasonable cost for the society, economy, and environment:

1

Introduce harmonised methods for the measurement and analysis of PFAS to strengthen the water system, ensuring its governance balances the interests of all stakeholders in its design.

2

Introduce an obligation to provide information on the presence of knowingly added PFAS along the supply chain, including the providers of chemical substances, mixtures or articles.

3

Unroll the ECHA PFAS restriction' process and subsequent additions to annex XVII of the REACH Regulation, ensuring that imported goods and products are submitted to the same restrictions[9].

4

Require industrial sites producing or using PFAS to cap PFAS flow in their discharges, releases and emissions, relying on adequate transition periods that allow for the implementation of such systems. Such requirement should also cover landfills for inert waste, as these lack a leachate collection system, and are, therefore, a potential source for PFAS in groundwater.

5

Introduce an Extended Producer Responsibility using a PFAS toxicity risk-based approach to transfer the charge the remedial costs for PFAS removal from drinking water and wastewater municipal companies, landfill operators and recycling companies to those putting PFAS containing substances, mixtures or articles for consumers on the market and releasing PFAS with clear evidence of health risks to the environment. The Extended Producer Responsibility should also apply for production site releases of toxic PFAS to the environment taking into account a necessary transition period.

6

Balance the regulation of PFAS with the need for certain essential uses in production and essential functions in products and technologies used in water and wastewater management systems, particularly for well-studied fluoropolymers of low concern with no evidence of health risks, used in for instance polyvinylidene fluoride (PVDF) membranes for water treatment, water technology component (e.g. O-rings, seals, valves, etc.), water management systems and electroplating facilities.

7

Finance research and innovation activities to find alternatives to PFAS uses as well as PFAS removal technologies, including specific applications with less economic interest[10].

8

Establish a list of approved and best available technologies for the safe management of PFAS concentrates, thereby avoiding PFAS concentrates management becoming a bottleneck for PFAS removal or that PFAS is re-introduced to the water cycle due to inappropriate management of PFAS concentrates.

9

Establish a health-based threshold for trifluoroacetic acid (TFA) and align a potential restriction with existing EU legislations influencing the level of TFA contamination in the environment and especially drinking water.

[9] REACH primarily addresses large PFAS compounds, while short-chain molecules pose significant challenges for water treatment. Preventing the replacement of long-chain PFAS with short-chain alternatives is crucial.

[10] For example, there is some technology such as membrane or NBS that need to be better explored. Water Europe, *Towards a Zero pollution strategy for contaminants of emerging concern in the urban water cycle*, Brussels, 2022, ISBN 9789464003130, page 16-17

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