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News

Innovation and Industry

Climate, environment and circular economy | Water cycle management

In response to the climate emergency and the ever-increasing demand for water, IFPEN is positioned as a key player in the sustainable and innovative management of this crucial resource. Thanks to its multidisciplinary expertise and collaborations, the institute actively contributes to reducing pressures on water and ensuring fair and sustainable access for future generations.

A RESOURCE UNDER PRESSURE

In a context of rapid climate change, water management has become a critical preoccupation for the future of our societies. A vital resource and one long perceived as being inexhaustible, water faces complex and growing challenges, threatening to undermine its accessibility, quality and sustainability. With two and a half billion people already living in water-stressed situations, the need for urgent action is self-evident.

THE IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES

The rise in global temperatures is causing major disruptions to water cycles. Long periods of drought, destructive floods and unpredictable rainfall are disrupting ecosystems, urban areas and human activities, while reducing freshwater supplies. At the same time, global demand could exceed supply by 40% by 2030, according to the United Nations.

This crisis is being exacerbated by demographic growth, rapid urbanization and intensive farming practices. Despite advances in wastewater treatment processes, industrial and urban emissions contribute to persistent and increasing pollution of water resources. Microplastics, PFAs, heavy metals and other emerging contaminants are generating complex challenges for the preservation of freshwater quality.

Did you know?

The United Nations' Sustainable development goal (SDG) number 6 is aimed at ensuring everyone has universal, fair and affordable access to drinking water, as well as to quality sanitation and hygiene. It also focuses on pollution reduction, the promotion of recycling and the reuse of treated wastewater, while encouraging the rational and sustainable management of this essential resource across all sectors.

IFPEN, COMMITTED TO DEVELOPING TECHNOLOGICAL SOLUTIONS FOR WATER

Against the backdrop of this critical situation, IFPEN is mobilizing its scientific and technological expertise to overcome the associated challenges. Its research targets the integrated and sustainable management of water resources via water cycle management optimization in industrial processes on the one hand, and, on the other hand, the development of innovative treatment solutions for both traditional (PAH, oils, COD, metals, etc.) and emerging industrial pollutants (PFAs and other micropollutants, microplastics, etc.). Accordingly, from the design stage of its industrial processes, IFPEN integrates solutions aimed at reducing their impact on water ecosystems. Its innovations include water-optimized processes, adapted to the production of biofuels, green chemistry products, and the recycling of batteries, plastics and catalysts.

CONTRIBUTING TO THE SUSTAINABLE

MANAGEMENT OF THE WATER CYCLE

IFPEN’s research is also part of a global approach to water resource management. Its specific knowledge in the fields of pollution characterization and transport and underground modeling for water resource management is channeled into the development of tools for characterizing and modeling underground water flows and surface hydro-sedimentary processes.

These technological solutions, developed in partnership with other research players, reinforce the resilience of water-stressed ecosystems and communities.

Spotlight: IFPEN, committed to sustainable and innovative water management
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