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Remedial measures to address marine pollution from microplastics and chemical pollutants in the context of the implementation of the new European Directive 2024/3019 on urban wastewater in Greece

2nd REMEDIES Policy Workshop Report and Policy Recommendations

22 January 2025 | Online

SEL NTUA

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Introduction: Purpose and policy relevance of the workshop

The 2nd REMEDIIES Policy Workshop, titled “Remedial measures to address marine pollution from microplastics and chemical pollutants in the context of the implementation of the new European Directive 2024/3019 on urban wastewater in Greece” was organised on 22 January 2025 by the Laboratory of Sanitary Engineering of the National Technical University of Athens within the framework of the REMEDIIES project.

The event addressed a critical transition in wastewater policy that affects marine health. Directive (EU) 2024/3019 concerning urban wastewater treatment introduces a more complex agenda than the previous urban wastewater framework. Beyond conventional collection and treatment obligations, the new Directive strengthens monitoring requirements, introduces quaternary treatment for selected micropollutants, risk assessment and extended producer responsibility in wastewater.

The workshop brought together policymakers, researchers, European project partners and wastewater utility representatives and for a discussion that connected regulatory requirements with implementation reality. The REMEDIIES project presented innovative solutions being tested for microplastics reduction in urban wastewater. The RHE-MEDIATION project introduced a governance and technology approach for reducing chemical pollution in the Mediterranean, including innovative tertiary wastewater treatment and continuous monitoring of emerging pollutants. Expert’s presentations further examined the progress in the analytical methodologies and holistic monitoring of organic micropollutants in the aquatic environment, the current state of knowledge on microplastics in the marine environment and the economic and implementation challenges of Directive (EU) 2024/3019. The open discussion that followed focused on the practical steps needed in Greece to support effective implementation.

In this brief, the key conclusions of this workshop are summarized into policy recommendations for the implementation of Directive (EU) 2024/3019 in Greece. The main points focused on early mobilization and coordination between authorities, the role of academic and research centers, analytical readiness, technology validation, strategic infrastructure planning, technical assistance of wastewater utilities and financing.

Workshop overview and agenda

Field	Description
Title	Remedial measures to address marine pollution from microplastics and chemical pollutants in the context of the implementation of the new European Directive 2024/3019 on urban wastewater in Greece
Workshop	2 nd REMEDIIES Policy Workshop
Date	22 January 2025
Location	Online workshop
Organiser	Laboratory of Sanitary Engineering, NTUA
Main focus	Marine pollution from micropollutants and microplastics; challenges in the implementation of Directive (EU) 2024/3019 on urban wastewater

Structure

Opening: Welcome and framing of the workshop objectives.

Part 1 – Expert presentations: Presentations on REMEDIIES, RHE-MEDIATION, Directive (EU) 2024/3019, organic micropollutants and marine microplastics.



Part 2 – Open discussion: Discussion with participants on implementation challenges, monitoring needs, treatment options, financing and implementation coordination in Greece.

Methodology and participants

The workshop combined:

- expert presentations from European research and innovation projects;
- policy framing linked to EU wastewater regulation;
- open discussion between scientific, policy and wastewater sector actors
- exchange of insights on monitoring, treatment technologies, financing and implementation needs;
- synthesis of key points into policy recommendations for Greece.

The methodology was designed to connect scientific evidence and technological innovation with the practical requirements of implementing Directive (EU) 2024/3019 in Greece. The workshop brought together 76 participants, including representatives of the Ministry of Environment and Energy, European research projects, universities, research institutes, water and wastewater utilities and technical experts.

Part 1: Expert presentations

The first part of the workshop set the scientific, technological and policy context for addressing microplastics and chemical pollutants through urban wastewater management.

The REMEDIATION presentation introduced innovative solutions being tested for the reduction and removal of microplastics in urban wastewater, highlighting the role of pilot-scale technologies and the need to validate their technological readiness level for wider application.

The RHE-MEDIATION presentation focused on chemical pollution in the Mediterranean and introduced a governance and technology approach combining monitoring, wastewater remediation with microalgae-based treatment, water reuse and biomass valorisation. It highlighted wastewater treatment plants as potential pathways through which emerging pollutants reach the marine environment and showcased a demonstration site where the project's technologies are being tested.

The presentation on Directive (EU) 2024/3019 examined the economic and implementation challenges of the revised Urban Wastewater Treatment Directive. It focused on the new obligations for quaternary treatment, extended producer responsibility, analytical protocols and monitoring, as well as the significance of project preparation and maturity, costing and pricing rules, determination of investment needs and available financing tools, compliance with deadlines, and public information.

The presentation on organic micropollutants in the aquatic environment outlined advanced analytical methodologies for priority and emerging contaminants, including targeted, suspect and non-target screening. It emphasised the need for holistic monitoring, improved data processing, risk assessment and harmonisation of analytical approaches.

Finally, the presentation on microplastics in the marine environment reviewed the current state of knowledge on sources, formation, size categories, environmental behaviour and ecological concerns. It underlined that microplastics are a known but still insufficiently understood pollutant, requiring clearer monitoring protocols, comparable data and further research on impacts.



Part 2: Open discussion

The open discussion focused on the practical implementation of Directive (EU) 2024/3019 in Greece and the conditions needed to move from regulatory obligations to operational readiness. Practical implementation questions were posed, such as which parts of the Directive are likely to be most difficult to implement, whether monitoring and laboratory capacity are ready, which treatment technologies can be deployed in the short term, and what type of scientific, technical and financial support public authorities and wastewater operators will need.

A key point raised was the need for early, well-coordinated transposition of the Directive into national law, supported by strong cooperation between national, regional and local authorities, wastewater operators, funding bodies and the ministries jointly responsible for implementation. The implementation will require strategic infrastructure planning, realistic design assumptions and ensuring proper operation and long-term maintenance. Monitoring was also identified as a central challenge, particularly because protocols for microplastics in wastewater are not yet sufficiently developed and the analytical market is not fully ready to provide routine services. The discussion underlined the need to distinguish between organic micropollutants, for which quaternary treatment is becoming a core obligation, and microplastics, where the immediate priority is monitoring, baseline data and methodological harmonisation. Risk assessment was also discussed as a key implementation tool, particularly for identifying areas where micropollutant concentrations may require quaternary treatment and for assessing water reuse.

Technology readiness was discussed in relation to both mature solutions and pilot systems. While some technologies, such as membrane bioreactors, can already support high removal, other innovative approaches such as microplastics flocculation-agglomeration pilot systems and microalgae-based treatment require further validation before broader application. Participants also highlighted sewage sludge as an important unresolved pathway for microplastics, especially when sludge is reused in agriculture.

Financing and extended producer responsibility were presented as major governance challenges. The discussion concluded that public authorities, municipalities, water and wastewater utilities and WWTP operators will need structured technical assistance, scientific support and nationally funded applied research to meet the Directive's ambitious requirements.

Cross-cutting insights

- Implementation must start soon, as the first milestones are approaching and the Directive is technically demanding.
- Harmonization of law should be linked to a national implementation roadmap.
- Monitoring protocols must be harmonised before large datasets are generated.
- Technology choices should be evidence-based, site-specific and assessed against lifecycle cost, energy needs and operational capacity.
- Wastewater operators, municipalities and public authorities will need structured technical assistance to prepare for the Directive's new requirements.
- Scientific support should be institutionalised through national research funding
- Financing and extended producer responsibility require transparent rules on costing, pricing and cost allocation.



Policy recommendations

1. Create a national implementation roadmap for Directive (EU) 2024/3019 supported by inter-ministerial working groups.

Greece should prepare a national roadmap to clarify responsibilities, timelines, financing needs and coordination mechanisms. Working groups of the ministries jointly responsible for implementation should mobilise all national, regional, local and operational actors early.

2. Institutionalise scientific and technical assistance to implementation bodies.

Given the complexity of Dir. (EU) 2024/3019, national authorities, as well as water utilities and municipalities, need structured support from universities and research centres, which should be institutionally organised.

3. Invest in laboratory capacity and accreditation.

Greece should support equipment, training, inter-laboratory comparisons, validation and accreditation pathways so that routine monitoring can move beyond a small number of research laboratories and become reliable at national scale.

4. Distinguish between micropollutant removal and microplastics monitoring.

Policy planning should recognise that organic micropollutants already require specific removal measures through quaternary treatment, while for microplastics, the immediate priority is robust monitoring.

5. Strengthen strategic infrastructure planning.

Funding, permitting, construction and operation of necessary infrastructure should be coordinated and resources should be properly allocated and managed. Infrastructure planning should be based on realistic design parameters, peak populations, operational needs and long-term maintenance capacity.

6. Provide technical assistance to wastewater operators and municipalities.

Wastewater operators and municipalities need and access to scientific expertise for risk assessment, technology selection, monitoring, costing, project preparation and public communication.

7. Prioritise mature treatment solutions while validating innovation pilots.

Immediate compliance should rely on proven, site-appropriate technologies, while innovative systems should be tested through pilots with clear performance, cost and scalability criteria.

8. Design a transparent extended producer responsibility system early.

The system should define covered producers and importers, contribution rules, risk and quantity criteria, administrative costs, fund transfer to operators and incentives for prevention and product reformulation.

9. Prepare mature investment projects for the next EU funding period.

Municipalities, water utilities and competent ministries should identify investment needs early and prepare projects by 2028–2029. This will allow Greece to claim sufficient funding in the next programming period for the implementation of the new Directive.

Conclusion

The revised Urban Wastewater Treatment Directive marks a new phase in European wastewater policy. It moves beyond conventional pollution control and requires Member States to address emerging contaminants, microplastics, monitoring, risk assessment, producer responsibility and long-term environmental protection.

For Greece, the Directive creates a demanding but necessary transition. The discussion showed that scientific knowledge and technological options are advancing, but implementation will depend on coordinated governance, harmonised monitoring, laboratory readiness, financing, technical assistance and national applied research.

The core policy message is that Greece should use the present period to prepare. Early action can reduce compliance risks, improve wastewater infrastructure, protect marine ecosystems and turn a difficult regulatory obligation into an opportunity for environmental resilience and innovation.

