What if ultrasound eliminated microplastics from oceans and lakes?

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Sonic Sweep

Within Reach | **Transitional** | Visionary

A chemical-free and scalable solution, ultrasonic waves remove microplastics from water, creating cleaner oceans and safer drinking water globally.

UNCERTAINTIES

Nature, Technology

MEGATREND (Most significant)

Evolving Ecosystems

TRENDS

Cross-Sectoral Partnerships
Food–Water–Energy Nexus
Mobilising Innovation
New Materials
Sustainable Waste Management

TECHNOLOGIES

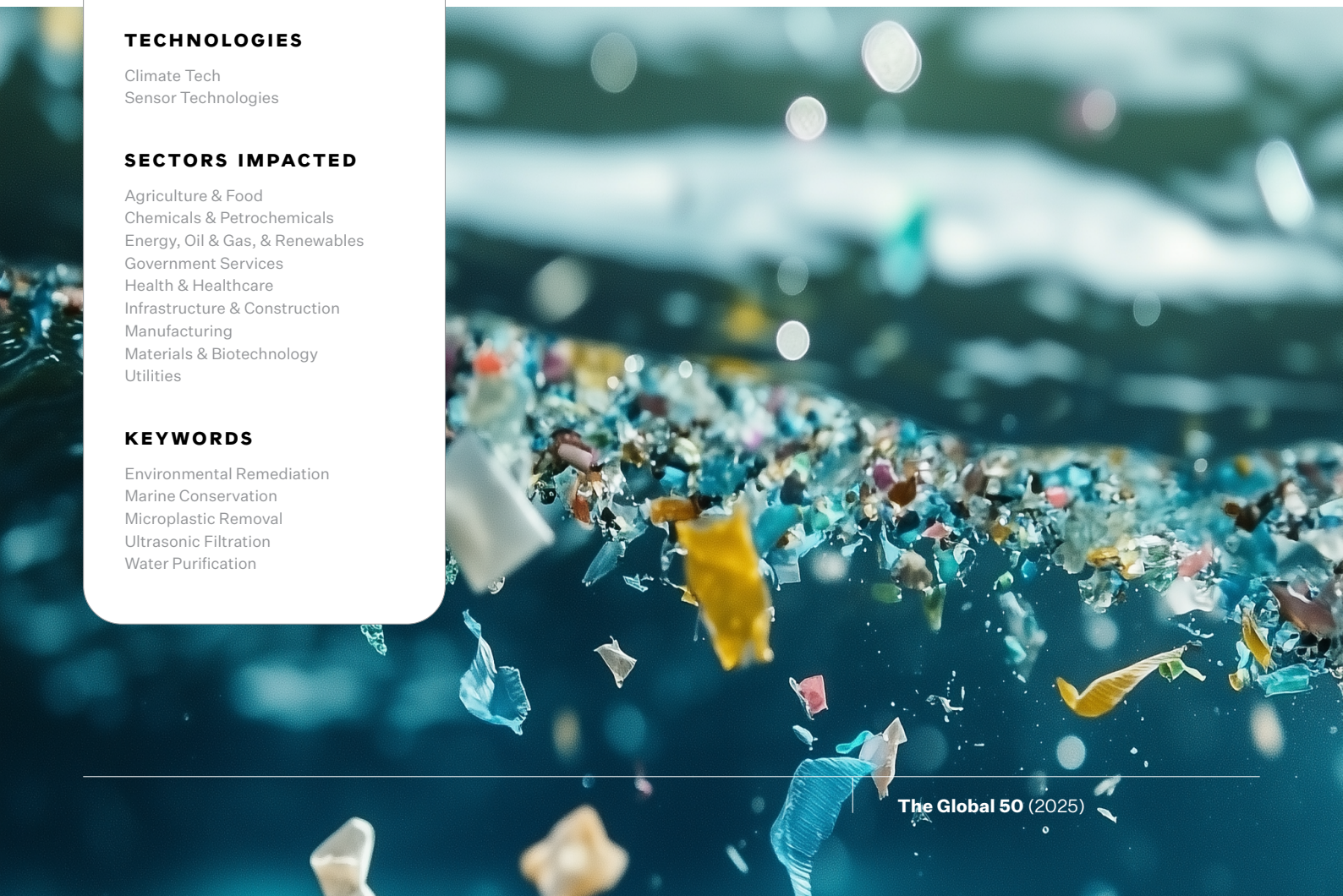
Climate Tech
Sensor Technologies

SECTORS IMPACTED

Agriculture & Food
Chemicals & Petrochemicals
Energy, Oil & Gas, & Renewables
Government Services
Health & Healthcare
Infrastructure & Construction
Manufacturing
Materials & Biotechnology
Utilities

KEYWORDS

Environmental Remediation
Marine Conservation
Microplastic Removal
Ultrasonic Filtration
Water Purification



WHY IT MATTERS TODAY

There are an estimated 50 to 75 trillion pieces[689] of plastic waste currently in our oceans, with up to 10 billion kg of plastic being added each year,[690] with up to 81% of ocean microplastics coming from their breakdown (secondary microplastics).[691] Irrespective of the route, by 2040, the amount of microplastics being released into the environment each year could more than double[692] – all amid rising concerns about their effects.[693]

From an environmental perspective, microplastics pose a dual threat as they leach chemicals into the ocean[694] and serve as magnets for heavy metals and organic pollutants.[695] These properties have detrimental impacts on marine habitats and marine organisms' behaviour.[696] Additionally, microplastics ingested by fish have been linked to gastrointestinal obstruction, enlarged colon, and impaired growth and health due to dietary disruption.[697] Plastic pollution impacts 267 marine species – harming 86% of sea turtles, 44% of seabirds, and 43% of marine mammals.[698]

Microplastic particles pose significant risks to human health through their interference with metabolic and physiological equilibrium,[699] particularly as it is thought that people consume between approximately 78,000 and 211,000 microplastic particles annually through food, drink and air.[700] These particles alter our oxidative balance, hormone regulation, cell growth, and inflammation markers, leading to diverse conditions.[701] Furthermore, microplastics serve as carriers for various environmental contaminants, potentially amplifying their detrimental health effects.[702]

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THE OPPORTUNITY

Ultrasound technology removes microplastics (10 to 1,000 micrometres) from water, offering a practical chemical-free solution for water purification systems, wastewater treatment plants, and industrial facilities.[703] Integrated at pollution hotspots, such as treatment plant outlets, ultrasonic wave generators[704] provide advanced filtration of various particle sizes,[705] directing microplastics to collection zones for analysis and removal.[706]

Early prototypes have shown promising results, removing up to 82% of microplastics[707] from up to 800 litres of water per hour in the laboratory.[708] This chemical-free, low maintenance approach[709] offers a scalable and sustainable path forward in addressing microplastic contamination on a global scale.

BENEFITS

Eco-friendly solution to microplastic water contamination; cleaner water; reduced use of chemicals; improved public health.

RISKS

Energy-intensive implementation; limited impact; scalability challenges; high costs due to subsequent waste removal.

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