

# HARNESSING THE POWER OF OZONE: TRANSFORMING WATER TREATMENT

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Water, a critical natural resource is an indispensable and fundamental need for humans' health and nations' economy. In the current era marked by global warming and frequent climate change events, ensuring water security is of paramount importance for nations to achieve their long-term development objectives. This includes safeguarding vulnerable water resources, catering to population demands, protecting vital infrastructure assets, and sustaining agricultural, energy, and industrial production with adequate availability of clean water.

The water resources face significant strain, and the delivery of water services falls short due to insufficient investment in the sector. Addressing this investment shortfall necessitates a blend of public, concessional, and private sources of financing, all channelled towards the attainment of key objectives of making clean water available with an emphasis on optimizing the contributions of both the public and private sectors.

## Emerging Challenges

Water is the planet's lifeblood, facing current and emerging challenges. There are multiple water crises manifesting globally, somewhere there is too much of water, elsewhere it is too little, and too polluted water everywhere. The biodiversity and the environment, food and energy production, business and industry, and entire ecosystem are facing the impact of disappearing resource.

As current trends persist, the world will have to confront a 40 percent deficit between water demand and supply by the year 2030. Already, 10 percent of

the global population resides in countries grappling with significant or acute water scarcity. There are over 2.3 billion people who lack the privilege of accessing clean and safe drinking water, while 3.6 billion people lack access to proper sanitation facilities. These circumstances have profound implications for public health, education, and the development of human capital.

There is a deep connection between water and climate change, as climate change serves to intensify risks associated with water and disrupt the hydrological cycle. Remarkably, nine out of every ten natural disasters are intricately tied to water. The projections indicate that by 2050, floods and droughts could result in a staggering \$5.6 trillion in cumulative losses for the global economy. Moreover, climate



change poses a direct threat to both lives and livelihoods, intensifying international tensions over increasingly scarce resources and chances of facing the 'war on water'.

**The climate change events like floods and droughts could result in staggering \$5.6 trillion losses for the global economy by the year 2050.**

Clean and safe drinking water is essential for human and nation. Despite technological innovations and economic progress, several regions around the world still struggle with water pollution and contamination issues. As the global population continues to grow, meeting the demand for clean water is becoming increasingly challenging. Ozone technology is emerging as a powerful and sustainable solution for cleaning water and ensuring its safety for consumption and various industrial applications. Ozone water treatment, a method used to reduce contaminants in water by harnessing the oxidative power of ozone. In the quest for innovative solutions, ozone technology has emerged as a powerful tool in purifying water, offering a sustainable and effective alternative to traditional water treatment methods. Ozone, being an oxidizing agent, readily reacts with other substances, accepting their electrons in the process. The process of ozone water treatment commences with the generation of ozone in an ozone generator. Subsequently, this ozone is introduced into the water, where it promptly initiates the oxidation process. Ozone can also be produced by electrolytic and chemical reactions, but UV and electrical ozone generators are the most common for water treatment.

**Water has no boundaries; it is an issue that demands attention and resources at every level, from the local and national to the regional and global.**

Ozone is a naturally occurring, triatomic form of oxygen, a highly reactive molecule. It is formed when oxygen molecules are exposed to energy in the form of ultraviolet light, electrical discharge, or chemical reactions. Ozone's reactivity is harnessed for water treatment purposes. When dissolved in water, ozone

reacts with organic and inorganic contaminants, effectively breaking them down into harmless byproducts. This process, known as oxidation, is a powerful disinfectant that effectively eliminates a wide range of pathogens, including bacteria, viruses, algae, hydrogen sulphide, metals, turbidity, and bad tastes and odors.

**Ozone Technology in Water Cleaning**

This environment-friendly method does not leave harmful residues and is widely used for disinfection and improving water quality. Ozone water treatment is a sustainable and efficient way to ensure safe and clean water for various applications, including drinking water, wastewater treatment, and swimming pool sanitation.

Some notable applications of ozone technology in water treatment:

**Disinfection and Sterilization:** Ozone is up to 50 times more effective than chlorine as a disinfectant. Ozone's strong oxidative properties make it highly effective in disinfecting water. It rapidly deactivates and destroys bacteria, viruses, and other pathogens without leaving harmful residuals or producing harmful byproducts. This capability is particularly valuable in providing safe drinking water, reducing the risk of waterborne diseases, and ensuring public health.

**Taste and Odor Control:** One of the common issues faced by water utilities across the globe is the presence of undesirable tastes and odors in water sources, mainly due to presence of organic compounds, such as algae or decaying vegetation. Ozone effectively breaks down these compounds, enhancing the taste and odor of treated water.

**Removal of Organic Compounds:** Ozone technology excels at removing organic pollutants such as pesticides, pharmaceuticals, and industrial chemicals from water. It can break down and transform chemicals, industrial solvents, and heavy metals into less harmful byproducts. This makes ozone technology a versatile choice for treating water from various sources, including industrial wastewater.

**Color and Turbidity Reduction:** Some water sources have the color and turbidity issues from the presence of natural organic matter or mixing of industrial effluents in it. Ozone aids in effective removal of color-causing compounds and particulate matter, resulting in crystal-clear water that also meets regulatory standards.

**Reducing Chemical Usage:** By harnessing ozone's oxidizing power, water treatment plants can reduce their reliance on traditional chemical disinfectants like chlorine. This not only lowers chemical costs but also

minimizes the formation of harmful disinfection byproducts, promoting cleaner and safer water.

**Cryptosporidium and Giardia Inactivation:** Ozone has been proven effective in eradicating waterborne parasites like Cryptosporidium and Giardia, which are notoriously resistant to conventional disinfection methods.

**Micro-Pollutant Removal:** Ozone technology can effectively break down a wide range of micro-pollutants, including pharmaceutical residues, endocrine-disrupting compounds, and personal care products, which pose significant challenges to traditional water treatment processes.

**Enhanced Water Quality in Pools and Spas:** Ozone is a popular choice for maintaining water quality in swimming pools and spas. It reduces the need for traditional chlorine or bromine disinfection, leading to improved water clarity reducing the production of potentially harmful disinfection byproducts.

**Environmental Sustainability:** Ozone is an environment friendly water treatment option that reduces the use of chemicals and does not leave harmful residues or byproducts. Its use promotes sustainable water management, contributing to the preservation of aquatic ecosystems and reducing the ecological impact of water treatment processes.

**Sahara Industry: Contributing with Sustainable Water Treatment**

Sahara Industry has established itself as a prominent player in the field of water treatment, particularly in the development and application of advanced filtration system using membrane technology. With a relentless commitment to innovation and a focus on addressing the pressing water challenges, Sahara Industry is revolutionizing the way we purify and manage this precious resource.





Sahara Industry's achievements over the past two decades can be attributed to its unwavering commitment to pioneering water treatment technology and systems. The utilization of advanced membrane technologies such as MBBR, RO, and UV filtration has proven instrumental in separating impurities from untreated water, providing an exceptionally efficient and sustainable water purification solution. It is also effectively used in industrial effluent treatment and producing ultra-pure water for the production.

Sahara Industry is committed to eco-friendly water treatment solutions. The advanced membrane and ozone technology aligns with sustainable practices by minimizing the need for chemical additives and reducing the generation of waste products. This approach contributes to a greener and more environmentally responsible water treatment process.

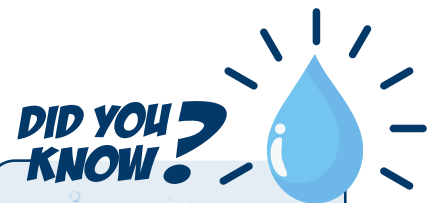
**With its dedication to excellence and commitment to improving water quality, Sahara Industry contributes to addressing water scarcity and pollution issues in India and beyond.**

With commitment to address water contamination challenges and catering to the increasing demand for clean water, it puts strong emphasis on research and development to continuously improve and expand their offerings. The commitment to innovation ensures that their solutions remain at the forefront and as a leader in water treatment solution; Sahara Industry has the ability to address a wide range of treatment

challenges that makes it a driving force in the ongoing quest for clean and safe water.

**Future Prospects**

In a world where the demand for sustainable water treatment solutions continues to rise, access to clean water is a fundamental human right and environmental preservation is a growing concern. As the demand for clean and safe water continues to grow, the role of ozone technology will undoubtedly become even more prominent in our quest for a healthier, more sustainable future.



The water we have on Earth is older than our solar system. It formed from interstellar clouds that existed before the Sun and the planets were born, carrying with it traces of ancient cosmic history.

**ABOUT THE AUTHOR**



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With a background in marketing and finance, the young entrepreneur has deftly steered his company towards becoming a leading manufacturer and provider of cutting-edge, top-notch water and wastewater treatment solutions in India. Employing a blend of contemporary business strategies, technological advancements, and visionary leadership, he has driven his group companies to achieve extraordinary growth, surpassing a turnover of INR 1200 million.

His Visionary approach and expertise have been instrumental in establishing the company as a leader in the industry, delivering efficient and effective solutions to meet the evolving needs to the market.