



WORLD FUTURE  
ENERGY SUMMIT

Part of



Hosted by



# INDUSTRY SPOTLIGHT

F R O S T & S U L L I V A N

## MIDDLE EAST WATER SECTOR FOCUSING ON WATER SECURITY OPPORTUNITIES

**INSIGHTS BY: NIDESHNA VARATHARAJAN**

*Senior Consultant – Energy & Environment Practice*  
Frost & Sullivan

A Frost & Sullivan Insight Prepared Exclusively  
for the **World Future Energy Summit 2023**

Responsible water management is the top priority for governments and industries across the world. The COVID-19 pandemic, climate change and water stress, which is a result of inefficient water management over the past several decades, are revitalizing the importance of resilient and sustainable water treatment and recycling infrastructure.

An increase in evaporation, high precipitation received as rain rather than snow, changes in the duration of seasons, rising water temperatures, and a decrease in water quality in interior and coastal areas have major implications on water resources because of climate change. The increase in evaporation could result in declining water quantity across many regions. Severe and frequent droughts could be another implication. This would increase the pressure on governmental organizations to effectively distribute water resources among agriculture, industrial, and municipal end users.

The Intergovernmental Panel on Climate Change (IPCC), part of the United Nations, is responsible for creating awareness of human-induced climate change and expects global warming of at least 1.5°C within the next two decades, which would result in radical changes in the water cycle and increase the Earth's temperature. Changing water cycles could result in already wet regions getting more rainfall and arid parts of the world facing severe droughts. The IPCC also states that for every additional 1°C of global warming, rainfall would intensify by 7%. Climate change's impact on water resources would be felt throughout the world, creating growth opportunities for water technology providers.

Municipalities and industries are adopting net-zero, decarbonization, and circularity goals to become sustainable, resilient, and future ready. Internet of Things (IoT)-based solutions are vital in helping end users achieve their net-zero targets. Utilities and industries have significantly increased their investments in adopting digital solutions such as smart online sensors for real-time monitoring of assets and advanced artificial intelligence (AI) based data analytics platforms to optimize the system on a real-time basis. Other digital technologies disrupting the water sector are AMI infrastructure, digital twins, intelligent asset management, and geographical information systems (GIS).



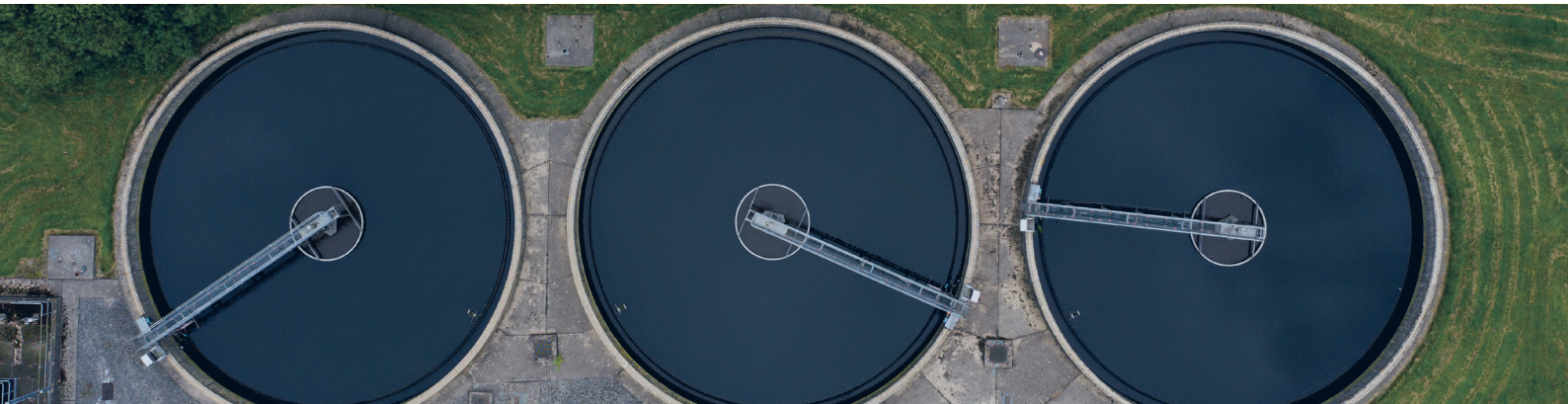
## Water and Wastewater Treatment Market Trends, Global



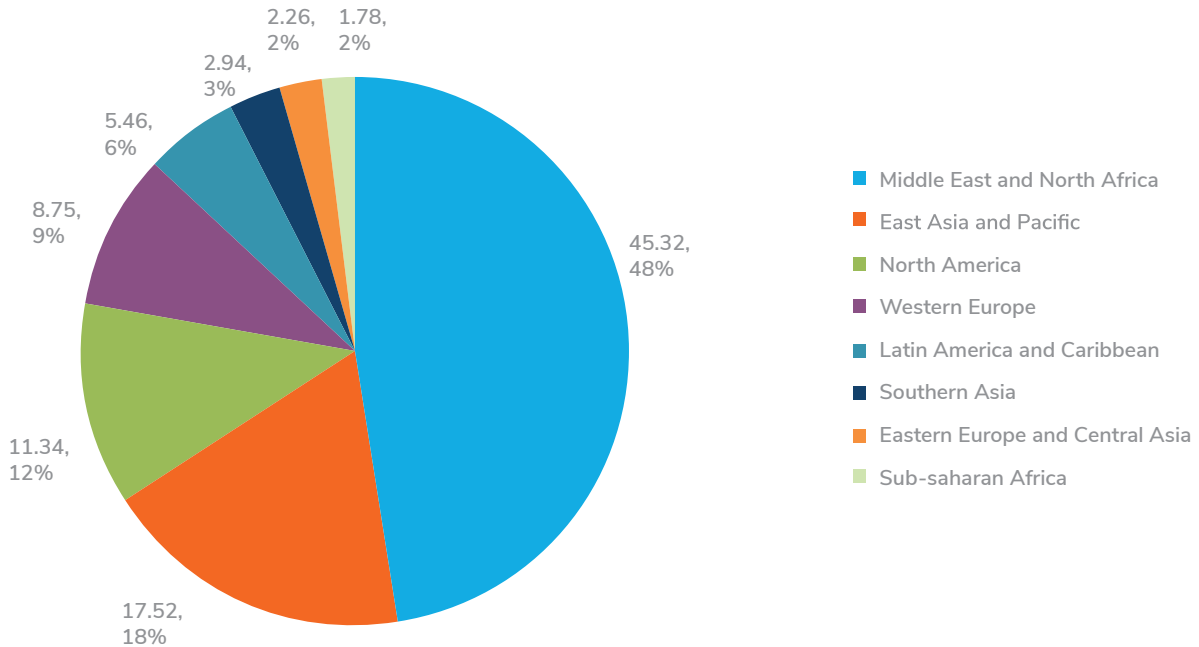
Source: Frost & Sullivan

Of the global trends, desalination, wastewater treatment and digitalization drive immediate growth opportunities for industry stakeholders in the Middle East.

**Desalination:** It has been the most widely adopted technology in the Middle East and North Africa, and the region is also the leader in developing desalination infrastructure, with almost 48% of the total operational desalination capacity. Lack of sufficient groundwater, low per capita water availability and growing water requirements across economic and social activities will continue to create demand for desalination technology in the Middle East.



## Installed Capacity of Operational Desalination Plants, Global, 2018



Source: Statista

Traditionally, the Middle East and North African region developed thermal desalination technologies, which are high-energy guzzlers. With increasing energy prices and the removal of subsidies for energy in the region, energy consumption by desalination plants came under scrutiny, leading to the development of reverse osmosis (RO)-based desalination plants. The most recent trend in the region is energy efficiency through renewables; climate action and sustainability factors also led to the integration of renewable energy with desalination technologies. The Jubail 3B project,<sup>1</sup> an independent water project using RO desalination technology, is currently under development in the Kingdom of Saudi Arabia (KSA). The project is designed in a way that the energy for freshwater production comes from a solar photovoltaic facility within the complex. This is in line with the KSA's Vision 2030 for reducing the energy intensity and carbon footprint of desalination plants. Another example is the development of the Shuaibah 3 seawater desalination plant, which will draw power from a 60 MW solar power plant and is expected to come online by 2025.<sup>2</sup>

1. [https://www.acciona.com/updates/articles/acciona-starts-construction-jubail-3b-desalination-plant-saudi-arabia/?\\_adin=02021864894](https://www.acciona.com/updates/articles/acciona-starts-construction-jubail-3b-desalination-plant-saudi-arabia/?_adin=02021864894)

2. <https://idadesal.org/doosan-enerbility-to-build-seawater-desalination-plant-in-saudi-arabia/>

**Wastewater Treatment:** One of the key growth opportunities in the wastewater treatment space is zero liquid discharge (ZLD) solutions. With the advent of the circular economy approach and stringent implementation of regulations, industries are developing and implementing recycling and recovery practices to improve resource efficiency. ZLD enables the recovery of usable water and treated contaminants from wastewater before reducing it to solid waste, thereby nullifying the harmful environmental impacts. ZLD is achieved by using multiple water treatment technologies to treat the concentrated contaminants in industrial and municipal wastewater. This includes RO, forward osmosis, membrane distillation, mechanical vapor compression (MVC), and electrodialysis. Given the low wastewater treatment levels in the regions, ZLD systems have high growth potential, and the Middle East ZLD market is expected to reach USD 90 million–100 million in revenues by 2025, growing at a compound annual growth rate (CAGR) of about 8.0% from 2020-2025.

### Key opportunity hotspots in the Middle East are the KSA, the United Arab Emirates (UAE) and Turkey:

- **KSA:** Economic development, population growth and urbanization, and increasing demand for water and energy pose a huge environmental challenge for the country. To surmount this challenge, the country aims to develop its wastewater treatment infrastructure to enable the recycling and reuse of water through the Vision 2030 program. The existing wastewater collection networks cover only about 50% of the total wastewater generated in the country. To achieve the 2030 Vision, the country encourages private sector participation, opening several opportunities for various stakeholders. The KSA announced projects worth USD 9.33 billion<sup>3</sup> at the MENA Desalination Projects Forum 2022. These include desalination, wastewater collection networks and wastewater treatment plants. The desalination capacity is expected to increase to 7.5 million cubic meters per day by 2027 from 2.54 million cubic meters per day in 2021. The country is also developing a network of 147 sewage treatment plants along with 14,925 kilometers of wastewater collection networks to enable recycling and reuse. These investments would drive growth opportunities in desalination and wastewater treatment for the private sector over the long term.
- **UAE:** Like the KSA, the UAE also has a strong project pipeline in the water sector. The country is expected to invest USD 2.08 billion in the desalination segment to achieve water security. The UAE developed the UAE Water Security Strategy 2036 and the National Water and Energy Demand Management Programme to ensure a sustainable water supply. One of the key objectives under the Water Security Strategy 2036 is to increase the reuse of treated water to 95%. Such initiatives are expected to create long-term growth opportunities in the UAE.

---

3. <https://smartwatermagazine.com/news/smart-water-magazine/saudi-arabia-announces-60-water-projects-worth-us933-billion>

- **Turkey:** Turkey has made considerable progress in economic and social development since 2000, resulting in increased employment opportunities and income levels, making the country an upper-middle-income economy. During the period from 2000, Turkey witnessed urbanization, maintained strong macroeconomic fundamentals and policy frameworks, and opened foreign trade and finance while also harmonizing laws and regulations to the European Union (EU) standards. These developments impacted the demand for water and wastewater treatment equipment. Turkey's per capita water availability was at 1,519 cubic meters per person per year in 2015, but this is expected to decline to 1,120 cubic meters per person per year by 2030. Inefficient water uses in certain segments, such as agriculture, have resulted in the over-abstraction of water resources, leading to water stress. Growing water stress is driving the demand for water and wastewater treatment products and systems in Turkey. Urban water infrastructure targets, as defined in the 11<sup>th</sup> Development Plan 2019-2023, aim to increase wastewater reuse to 5% by 2023 from 1.2% in 2018, driving demand for recycling systems based on ZLD and RO technologies.





## About Frost & Sullivan

For over six decades, Frost & Sullivan has helped build sustainable growth strategies for Fortune 1000 companies, governments, and investors. We apply actionable insights to navigate economic changes, identify disruptive technologies, and formulate new business models to create a stream of innovative growth opportunities that drive future success.

Our passionate commitment to growth starts with our Growth Pipeline Dialog, an all-hands approach that puts your management team in a room with our growth experts, addresses your top challenges, identifies areas of disruption, and develops tailored roadmaps and go-to-market strategies.

With over 1,200 experts and 60 years of experience, Frost & Sullivan is uniquely positioned to help you uncover millions of growth opportunities, guided by our moral imperative to make the world a better place through sustained growth.

### DUBAI

2601, Swiss Tower, Cluster Y  
PO Box 33372  
Jumeirah Lake Towers  
Dubai, UAE  
Tel: +971 4 433 1893

### RIYADH

F16, Level 1, Localizer Mall  
2803 Prince Muhammad Bin  
Abdulaziz Rd  
Al Olaya, Riyadh 12222  
Tel: +966 11 486 8463

Schedule your complimentary **Growth Pipeline Dialog™** today to start your journey toward sustained growth by clicking [here](#).

myfrost@frost.com

 877.GoFrost

 <http://www.frost.com>