

Global markets for environmental remediation technologies

By BCC Publishing Staff

The global market for environmental remediation technologies was valued at \$82.5 billion in 2022 and is expected to grow at a compound annual growth rate (CAGR) of 7.1% to reach \$124.5 billion by 2028.

Environmental remediation is the removal of pollution or contaminants from the water, soil, and air. Removal can take place through either destruction or separation of the pollutants from the environment. Generally, a few treatment approaches are consolidated because no single method can remediate an entire contaminated site. Furthermore, geographical differences impact the approaches used. For example, regions with rocky soils may require different technologies to remediate contaminated groundwater than areas with sandy soils.

Although technological developments and adoption of new technologies are generally slower in the environmental remediation market than in other industries, this market is mature due to longstanding environmental regulations in various countries. As sustainability becomes a broader topic of public discussion, companies continue to focus on product innovations and low-cost strategies to increase their share of the market. Emerging technologies for environmental remediation include

- **Bioremediation:** This approach relies on living organisms to clean up contaminated sites. This method can involve introducing microorganisms that degrade specific pollutants or using plants to absorb and remove contaminants from the soil and water.
- **Chemical reduction and oxidation:** This approach involves converting hazardous pollutants to less toxic or less hazardous contaminants through chemical reduction and/or oxidation processes. Nanoparticles are being explored as reactants in this process.
- **Electrokinetic remediation:** This technology uses an electric field to drive the movement of ions and water in contaminated soil and thereby removes heavy metals and other pollutants from the soil.
- **Steam stripping:** This method moves volatile contaminants from water to air. To vaporize volatile and semivolatile pollutants, steam is injected into the soil through an injection well. Vacuum extraction is then used to remove the contaminated vapor steam. Through condensation and phased separation processes, the pollutants are captured.

Table 1. Global market for environmental remediation technologies, by application, through 2028 (\$ millions)

Application	2022	2023	2028	CAGR % (2023–2028)
Oil and gas industry	13,810.0	4,916.4	21,937.3	8.0
Landfill and land development	12,232.7	13,289.5	20,165.6	8.7
Mining and forestry	12,382.3	3,257.6	18,669.3	7.1
Manufacturing	11,314.5	12,067.7	16,670.3	6.7
Chemical production and processing	9,476.8	10,021.5	13,252.1	5.7
Agriculture	8,529.9	8,952.3	11,411.2	5.0
Automotive	6,545.9	7,012.5	9,899.3	7.1
Other applications	8,257.5	8,893.2	12,576.4	7.2
Total	83,549.9	88,410.9	124,581.4	7.1

- **Ultraviolet oxidation:** This technology uses ultraviolet radiation, ozone, or hydrogen peroxide to detoxify or destroy organic pollutants as water flows into the treatment tank. Chlorine gas and dechlorinated materials are the reaction products.

In addition, the U.S. Federal Remediation Technologies Roundtable offers interactive “decision support” software tools that can be incorporated into a structured decision-making process for environment site clean-up. The tools support multiple functions, such as data acquisition, spatial data management, modeling and cost estimating. View the full list of tools at <https://www.frtr.gov/decisionsupport>.

North America accounted for 33.5% of the global market for environmental remediation technologies, followed by Europe (28.7%) and Asia-Pacific (20.6%). North America has a large and mature market for these technologies due to the region’s long history of industrial development and the presence of many contaminated sites. In contrast, in Europe and Asia-Pacific, the market is influenced by rapidly expanding industrialization.

About the author

BCC Publishing Staff provides comprehensive analyses of global market sizing, forecasting, and industry intelligence, covering markets where advances in science and technology are improving the quality, standard, and sustainability of businesses, economies, and lives. Contact the staff at Helia.Jalili@bccresearch.com.

Resource

BCC Publishing Staff, “Global markets for environmental remediation technologies,” BCC Research Report ENV006E, March 2024. <https://bit.ly/BCC-March-2024-remediation> ■