Industrial Zero-Liquid-Discharge (ZLD) Systems

ANMD-MRS10-100 · Water & Environmental Technologies

A Global Sustainability Due Diligence & Market Research Study

History 2020–2024 · Base Year 2025 · Forecast 2025–2032 · Outlooks 2035 / 2040 / 2050 · Currency US$

WHY THIS REPORT

Zero-liquid-discharge (ZLD) systems eliminate liquid waste from industrial operations — recovering nearly all water and concentrating contaminants to solids for disposal or reuse, spanning evaporator-crystallizer trains, membrane-based and hybrid thermal-membrane systems, minimal-liquid-discharge variants and brine concentration. This decision-grade study sizes the global market three ways — value, treatment capacity (m³/day) and systems — across ZLD technology, process stage and application, across seven regions and four scenarios to 2032, with outlooks to 2050.

SUSTAINABILITY & SDG IMPACT — THE ANMD LENS

Sustainability is this report's backbone, not an afterthought — balancing recovery against energy. ZLD eliminates discharge and recovers water and salts, but is energy-intensive, making efficiency and renewable coupling central to the case.

Mapped Sustainable Development Goals:

SDG 6	SDG 9	SDG 11	SDG 12	SDG 13
Clean Water & Sanitation	Industry, Innovation & Infrastructure	Sustainable Cities & Communities	Responsible Consumption	Climate Action

Measurable sustainability outcomes assessed:

- Regulatory compliance and effluent-discharge elimination
- Water and salt recovery in water-stressed regions
- Resource recovery turning residuals into products
- Energy/carbon intensity and solids disposal as material risks

Framework alignment: Double materiality mapped to GRI, SASB, ISSB, TCFD, TNFD, CSRD and the EU Taxonomy, with greenwashing and SDG-washing screens applied throughout.

WHAT'S INSIDE AT A GLANCE

53 Chapters	**9** Report Parts	**7** Regions Covered	**40+** Country Markets
2025–32 Forecast Horizon	**4** Forward Scenarios	**25+** Companies Profiled	**5** SDGs Mapped

REPORT COVERAGE

Geographic scope: North America, Europe, Asia Pacific, Latin America, Africa, Middle East and Rest of World — with named country intelligence. Asia Pacific dominates demand; the Middle East scales on scarcity; the Americas grow on regulation; other regions assessed on their own merits.

MARKET OVERVIEW

From compliance mandate to circularity strategy — where hybrid trains cut the energy penalty of full ZLD.

Industrial ZLD is moving from compliance mandate to a water-recovery and circularity strategy. Demand is driven by discharge regulation, water scarcity and corporate stewardship across Asia Pacific, the Middle East and the Americas. The market is read three ways — value, treatment capacity and systems — and forecast under four scenarios, each region reported separately.

- **Asia Pacific dominates demand** — China and India, where strict discharge mandates and water scarcity force industrial ZLD adoption
- **Middle East scales on scarcity** — Saudi Arabia and the UAE, where water stress and industrial growth drive recovery systems
- **Americas grow on regulation** — United States, on power, oil-and-gas and mining ZLD projects responding to discharge limits
- **Hybrid thermal-membrane is the differentiator** — membrane brine concentration ahead of evaporation cuts the energy and cost penalty of full ZLD

REGIONAL OUTLOOK

Across seven reporting regions, the report separates leading markets from high-growth and emerging ones — each profiled in full rather than aggregated into Rest of World.

Region	Stage	Lead Markets & Drivers
Asia Pacific	Demand leader	China, India — discharge mandates, water scarcity, industry
Middle East	Scarcity-led	Saudi Arabia, UAE — water stress, industrial growth
North America	Regulation-led	United States — power, oil & gas, mining ZLD
Europe	Stewardship demand	Germany, Italy — industrial stewardship, discharge limits
Latin America	Emerging	Chile, Brazil — mining brine, industrial reuse
Africa	Frontier	South Africa — mining & industrial discharge control

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
• Strict discharge & ZLD regulation • Industrial water scarcity & recovery • Corporate water-stewardship & ESG • Membrane brine-concentration gains • Resource & salt recovery value	• High energy & operating cost • Very high CAPEX of full ZLD • Solids handling & disposal burden • Scaling, corrosion & reliability issues • Complex operation & skilled-staff needs

SEGMENTATION SNAPSHOT

By ZLD Technology	Evaporator-crystallizer · membrane-based · hybrid thermal-membrane · minimal-liquid-discharge (MLD) · brine-concentration
By Process Stage	Pre-concentration · brine concentration · evaporation · crystallisation
By Application	Municipal · industrial · commercial & residential
By End User	Utilities · municipalities · industry · buildings
By Business Model	Equipment sales · EPC · Water-as-a-Service
By Scale	Decentralised · commercial · municipal / utility-scale

TABLE OF CONTENTS — PARTS & CHAPTERS

The full report is organised into nine parts across 53 chapters, listed below. Detailed sub-headings, country tables and directories are provided in the full report.

COMPETITIVE & INVESTMENT SNAPSHOT

The competitive field spans thermal-ZLD majors, membrane brine-concentration specialists, and resource-recovery innovators. Deal activity — hybrid-ZLD projects, brine-concentration ventures and discharge-compliance contracts — signals a market consolidating around lower-energy recovery.

Representative players profiled in the full report:

Veolia Environnement S.A. (HPD) · SUEZ SA · Aquatech International LLC · Gradiant Corporation · GEA Group Aktiengesellschaft · and 20+ further profiled players across thermal-ZLD majors and recovery innovators.

Investment intelligence: venture, infrastructure, development, climate and blended finance, green bonds and sustainability-linked loans — culminating in a bankability assessment and a conditional investment view.

KEY QUESTIONS THIS REPORT ANSWERS

- How large is the global industrial ZLD market, and how fast will it grow to 2032?
- Which regions, countries and segments offer the strongest risk-adjusted opportunity?
- How does hybrid thermal-membrane design change ZLD economics versus full evaporative ZLD?
- Who leads, and where is the competitive and patent white space?
- Is the investment case bankable — and under what conditions?
- How does the category align with the SDGs, industrial circularity and disclosure regulation?

WHY ANMD — THE DIFFERENCE

Most market studies stop at units and revenue. This report is built as a sustainability due diligence instrument — fusing market sizing with ESG, SDG, climate, water and natural-capital intelligence and a decision-ready bankability view in a single architecture.

- **Triangulated sizing** — every market read three ways so value, volume and the physical-unit views reconcile rather than conflict.
- **Region-honest forecasting** — Latin America, Africa and the Middle East reported in full, never hidden inside Rest of World, every forecast resolved to the 2025 base year.
- **Integrated evidence base** — company, patent and project databases linked to the analysis, with published-filing patents and FTO treated as an indicator, not a legal conclusion.
- **No-fabrication discipline** — every estimate carries a data-confidence rating and disclosed sources; gaps are flagged for further diligence, never filled with invented numbers.
- **Anti-greenwashing rigour** — SDG-washing and greenwashing screens plus claim-substantiation checks built into the ESG and project analysis.
- **Decision-first structure** — 9 Parts and 53 Chapters culminating in stakeholder playbooks and a clear, conditional investment view.

WHO SHOULD BUY THIS REPORT

Investors, manufacturers, developers, utilities, lenders and policymakers, and strategic corporate planners and decision-makers.

Access the Full Report

The complete report delivers all 53 chapters in full, with every sub-heading, country table, company and patent directory, forecast model and due diligence checklist.

Purchase at **www.anewmarketdynamics.com** · Standard & Premium licences · Single-Site (SSL) and Global-Site (GSL) options at checkout.

Want the Complete Detailed Table of Contents?

This prospectus lists the nine parts and 53 chapters. The complete detailed table of contents — every sub-heading, country table, exhibit, company and patent directory and annex — is available on request to registered users. To receive it, register with your official company email at **www.anewmarketdynamics.com**. The full detailed table of contents will be sent directly to your registered company email address.