

ANMD-MRS35-343 · Waste-to-Energy Technologies

Biogas Upgrading Systems

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

Biogas upgrading systems purify raw biogas into grid- and transport-grade biomethane (RNG) by removing CO2 and impurities — using membrane, PSA, water-scrubbing and amine technologies to unlock renewable-gas value. This decision-grade study sizes the global market three ways — value, units shipped and upgrading capacity (Nm3/h) — across system type, component 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. Beyond gas, biogas upgrading delivers measurable renewable-gas supply, methane-emissions reduction and transport-fuel decarbonisation, strengthening the circular-energy story.

Mapped Sustainable Development Goals:

SDG 7 Affordable Clean Energy	SDG 13 Climate Action	SDG 11 Sustainable Cities	SDG 12 Responsible Consumption	SDG 15 Life on Land
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Measurable sustainability outcomes assessed:

- Renewable natural gas (RNG) supply to grid and transport
- Methane-emissions and climate-impact reduction
- Transport-fuel and gas-grid decarbonisation
- Methane-slip, grid-injection barriers and feedstock variability 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

MARKET OVERVIEW

From raw biogas to pipeline-grade RNG — where membrane and PSA upgrading turn waste gas into renewable fuel.

The biogas upgrading systems market is moving from raw-biogas use to pipeline- and transport-grade RNG production. Demand is driven by RNG mandates and renewable-gas incentives, transport-fuel and gas-grid decarbonisation and methane-emissions targets, supported by membrane, PSA and scrubbing technology advances. The market is read three ways — value, units shipped and upgrading capacity — and forecast under four scenarios, each region reported separately.

- Europe leads on commercial upgrading — Germany, France, the Netherlands and the Nordics, on RNG mandates and gas-grid injection
- Asia Pacific is the scale engine, with China, Japan, India and South Korea on waste growth and new-build programmes
- System type and scale segment the value — across membrane, PSA, water-scrubbing and amine configurations
- Low-slip, efficient upgrading is the differentiator — high methane recovery unlocks RNG credit value

REGIONAL OUTLOOK

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

Region	Stage	Lead Markets & Drivers
Europe	Commercial leader	Germany, France, Netherlands, Nordics — landfill bans, circular-economy targets, district heating
Asia Pacific	Scale engine	China, Japan, India, South Korea — urban waste growth, new-build programmes, industrial demand
North America	Accelerating	United States, Canada — RNG incentives, landfill diversion, plant modernisation
Latin America	Emerging	Brazil, Mexico — waste-management investment, methane-mitigation projects
Africa	Frontier	South Africa, Morocco, Egypt — waste infrastructure build-out, blended finance
Middle East	Frontier	Saudi Arabia, UAE, Israel — waste-management investment, circular-economy strategies

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
<ul style="list-style-type: none"> • RNG mandates & renewable-gas incentives • Transport-fuel & gas-grid decarbonisation • Methane-emissions & climate targets • Farm, food & landfill biogas resource growth • Membrane, PSA & scrubbing technology advances 	<ul style="list-style-type: none"> • Capital cost & project-scale economics • Methane-slip & efficiency trade-offs • Grid-injection & interconnection barriers • Policy & credit-scheme dependence • Feedstock & gas-quality variability

SEGMENTATION SNAPSHOT

By System Type	Water-scrubbing · membrane · PSA (pressure-swing) · amine-scrubbing · cryogenic
By Component	Membranes · scrubbers · PSA vessels · compressors · controls
By Application	Biogas producers · utilities · fuel distributors · agriculture
By End User	Biogas producers · utilities · fuel distributors · agriculture
By Business Model	Equipment sale · EPC / turnkey · BOT / concession · O&M; contract
By Scale	Small (farm) · mid · large

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.

Part I — Report Foundation, Discovery and Strategic Intelligence

- › Chapter 1. Scope, Methodology and Report Architecture
- › Chapter 2. Industry Discovery Summary — Biogas Upgrading Systems
- › Chapter 3. Executive Intelligence and Decision Dashboard
- › Chapter 4. Strategic Findings, Materiality and Investment Verdict Preview

Part II — Market Intelligence, Sizing, Forecasting and Segmentation

- › Chapter 5. Industry Overview and Market Evolution
- › Chapter 6. Market Dynamics
- › Chapter 7. Global Market Size and Forecast, 2020–2032
- › Chapter 8. Market Segmentation Analysis
- › Chapter 9. End-User and Demand-Side Intelligence
- › Chapter 10. Pricing, Cost and Commercial Model Intelligence

Part III — Regional and Country Intelligence

- › Chapter 11. Global Regional Intelligence Framework
- › Chapter 12. North America Market Intelligence
- › Chapter 13. Europe Market Intelligence
- › Chapter 14. Asia Pacific Market Intelligence
- › Chapter 15. Latin America Market Intelligence
- › Chapter 16. Africa Market Intelligence
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- › Chapter 18. Rest of World Market Intelligence

Part IV — Technology, Innovation and Category-Specific Intelligence

- › Chapter 19. Technology Landscape and Architecture
- › Chapter 20. Emerging and Next-Generation Technology Intelligence
- › Chapter 21. Category-Specific Intelligence Module
- › Chapter 22. Research, Innovation and Funding Landscape

Part V — Company, Competition, Patent and Project Intelligence

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- › Chapter 25. Mergers, Acquisitions, Partnerships and Ecosystem Intelligence
- › Chapter 26. Patent Landscape and Intellectual Property Intelligence
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- › Chapter 29. ESG Intelligence and Double Materiality
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- › Chapter 38. Policy, Regulation and Incentive Intelligence
- › Chapter 39. Legal, Contracting and Risk-Allocation Intelligence
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- › Chapter 41. Investment, Sustainable Finance and Bankability Intelligence

Part VIII — Scenario, Future Intelligence and Final Due Diligence Verdict

- › Chapter 42. Scenario Analysis and Future Intelligence
- › Chapter 43. Sustainability Due Diligence Framework and Data-Room Index
- › Chapter 44. Risk Register, RAG Rating and Anti-Greenwashing Screen
- › Chapter 45. Bottom-Line Verdict and Strategic Recommendations
- › Chapter 46. Implementation Roadmap and Stakeholder Playbooks

Part IX — Annexes, Directories and Reference Material

- › Chapter 47. Methodology Annex
- › Chapter 48. Corporate Directory and Company Intelligence Annex
- › Chapter 49. Patent Directory and Patent Intelligence Annex
- › Chapter 50. Project Intelligence Annex
- › Chapter 51. Forecast Annex
- › Chapter 52. Sustainability KPI Annex
- › Chapter 53. Reference Annexes

COMPETITIVE & INVESTMENT SNAPSHOT

The competitive field spans upgrading-technology specialists, established gas-equipment manufacturers, and RNG innovators. Deal activity — RNG project financing, technology acquisitions and developer partnerships — signals a market consolidating around efficient, low-slip systems.

Representative players profiled in the full report:

Greenlane Renewables Inc. · Pentair Haffmans B.V. · DMT Environmental Technology B.V. · L'Air Liquide S.A. · Malmberg Water AB · and 20+ further profiled players across the value chain.

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

KEY QUESTIONS THIS REPORT ANSWERS

- ? How large is the global biogas upgrading systems market, and how fast will it grow to 2032?
- ? Which regions, countries and segments offer the strongest risk-adjusted opportunity?
- ? How do the economics of biogas upgrading systems change returns versus incumbent approaches?
- ? Who leads, and where is the competitive and patent white space?
- ? Is the investment case bankable — and under what conditions?
- ? How does the technology align with the SDGs and emerging 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 verdict in a single architecture.

- › **Triangulated sizing** — every market read across three ways — value, units shipped and upgrading capacity (Nm³/h) so the 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, decision-ready investment verdict.

WHO SHOULD BUY THIS REPORT

Investors and infrastructure / PE funds, EPCs and technology licensors, biogas producers and utilities, fuel distributors and agriculture, municipalities, research institutions, policymakers and lenders, and corporate strategy and ESG teams. This report supports investors, operators, developers, manufacturers, lenders and policymakers — alongside 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.