

Predictive Maintenance Platforms for Ship Engines

ANMD-MRS22-218 · Marine AI Solutions

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

Predictive maintenance platforms bring condition monitoring, AI analytics and digital twins to marine propulsion, turning reactive, calendar-based servicing into data-driven, failure-anticipating maintenance. Purpose-built systems across main engines, auxiliaries and fuel/lubrication systems let owners and managers cut downtime, avoid failures and optimise spares. This decision-grade study sizes the global market three ways — value, vessels under monitoring and downtime-reduction percentage — across capability, system focus 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 uptime, predictive maintenance delivers measurable fewer failure-driven emissions and spills, optimised spares use and extended asset life, while reliability gains strengthen the resource-efficiency story.

Mapped Sustainable Development Goals:

SDG 9 Industry, Innovation & Infrastructure	SDG 12 Responsible Consumption & Production	SDG 13 Climate Action
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Measurable sustainability outcomes assessed:

- Fewer failure-driven emissions and spills
- Optimised spares use and extended asset life
- Data-ownership and cyber-security as a material risk
- Model-assurance and over-maintenance avoidance assessed

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	3 SDGs Mapped

REPORT COVERAGE

Geographic scope: North America, Europe, Asia Pacific, Latin America, Africa, Middle East and Rest of World — with named country intelligence. Europe leads early commercialisation; Asia Pacific is the scale engine; North America is accelerating; other regions assessed on their own merits.

- Fewer breakdowns, reduced off-hire and lower maintenance cost
- Condition-monitoring, predictive-analytics and digital-twin platforms
- Coverage of main engines, auxiliaries and fuel/lubrication
- Data-ownership, cyber-security and model-assurance as risks

MARKET OVERVIEW

From calendar-based servicing to failure-anticipating maintenance — where reduced off-hire and digital-twin prognostics underpin returns calendar maintenance cannot match.

Marine predictive maintenance is moving from periodic surveys to continuous, AI-driven condition monitoring. Demand is driven by off-hire cost pressure, crew-efficiency needs and reliability requirements across Europe, Asia Pacific and North America. The market is read three ways — value, vessels under monitoring and downtime-reduction percentage — and forecast under four scenarios, each region reported separately.

- **Europe leads early commercialisation** — Finland, Germany, Norway and the United Kingdom, where engine-OEM analytics, class CBM schemes and digital-twin tooling are most advanced
- **Asia Pacific is the scale engine** — China, Japan, South Korea, Singapore and Australia, combining large fleets and shipbuilding bases with strong reliability drivers
- **Uptime and cost are the differentiator** — reduced off-hire plus optimised spares — and increasingly digital-twin prognostics — underpin returns calendar-based maintenance cannot match
- **Capability and system focus segment the value** — condition-monitoring, predictive-analytics and digital-twin platforms across main-engine, auxiliary and fuel/lubrication systems, each with distinct economics

REGIONAL OUTLOOK

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

Region	Stage	Lead Country Markets & Drivers
Europe	Commercial leader	Norway, UK, Finland, Netherlands — class guidance, autonomy trials, smart-port & decarbonisation drivers
Asia Pacific	Scale engine	China, Japan, South Korea, Singapore, Australia — shipbuilding base, port efficiency, fleet scale
North America	Accelerating	United States, Canada — coast-guard & defence programmes, port modernisation, maritime-AI ventures
Latin America	Emerging	Brazil, Chile — ports, fisheries and offshore-energy adoption
Africa	Frontier	South Africa, Kenya, Morocco — port development, fisheries protection, blended finance
Middle East	Frontier	Saudi Arabia, UAE, Israel — port investment, maritime security, sovereign capital

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
• Off-hire & downtime cost pressure • Class-society condition-based-maintenance schemes • Engine-OEM service & reliability programmes • Spare-parts & maintenance-cost optimisation • IoT sensor, AI-analytics & digital-twin gains	• Sensor retrofit & data-acquisition cost • Onboard connectivity & data-transfer limits • Model accuracy & false-alarm management • Data-ownership between owner & OEM • Crew-skills & maintenance-culture change

SEGMENTATION SNAPSHOT

By Capability	Condition monitoring · predictive analytics · digital twin
By System Focus	Main engine · auxiliary / gensets · fuel & lubrication
By Application	Newbuild · retrofit · fleet-wide rollout
By End User	Ship owners · managers · engine OEMs · class societies
By Business Model	Software licence · SaaS · per-vessel · outcome-based
By Scale	Pilot · fleet rollout · enterprise platform

TECHNOLOGY & APPLICATION FINDINGS

Where the category is differentiating fastest — the technology and application fronts that separate leaders from followers:

- **Main engine** — two-stroke and four-stroke propulsion benefits from vibration, thermal and combustion monitoring
- **Auxiliary & gensets** — generators and pumps pair well with condition-monitoring and anomaly detection
- **Fuel & lubrication** — fuel-system and lube-oil analytics leverage sensor data for early-fault prognostics

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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.

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COMPETITIVE & INVESTMENT SNAPSHOT

The competitive field spans engine-OEM analytics divisions, established marine-systems manufacturers, and maintenance-AI innovators. Deal activity — OEM-analytics partnerships, digital-twin acquisitions and class-society tie-ups — signals a market consolidating around integrated, prognostic platforms.

Representative players profiled in the full report:

Wärtsilä Corporation · MAN Energy Solutions SE · Kongsberg Gruppen ASA · ABB Ltd · Caterpillar Inc. (Caterpillar Marine) · and 20+ further profiled players.

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 marine predictive maintenance market, and how fast will it grow to 2032?
- Which regions, countries and segments offer the strongest risk-adjusted opportunity?
- Which technologies and platforms reshape the addressable market and the cost curve?
- 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 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 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

Ship owners, managers, engine OEMs, class societies, maritime operators, investors 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.