

Quantum Sensors

ANMD-MRS24-232 · Quantum & Advanced Computing

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

Quantum sensors exploit quantum states — cold atoms, nitrogen-vacancy (NV) centres in diamond and atomic vapours — to measure time, magnetic and gravitational fields, rotation and electric fields with precision classical instruments cannot match. The technology spans atomic clocks, magnetometers and gravimeters / inertial sensors, moving from defence and metrology into healthcare, navigation, energy and resource exploration. This decision-grade study sizes the global market three ways — value, deployed units and sensing channels — across segmentation, seven regions and four scenarios to 2032, with outlooks to 2050.

SUSTAINABILITY & SDG IMPACT — THE ANMD LENS

The sustainability case is concrete. Quantum sensors enable resilient navigation, early medical diagnosis and efficient resource exploration with low operating energy relative to the systems they upgrade. The analysis applies double materiality, maps outcomes to GRI, SASB, ISSB, TCFD, TNFD, CSRD and the EU Taxonomy, and Helium supply for cryogenics, dual-use defence governance and rare-material sourcing are treated as material risks — with greenwashing and SDG-washing screens applied throughout.

Mapped Sustainable Development Goals:

SDG 9 Industry & Infrastructure	SDG 3 Good Health & Well-being	SDG 13 Climate Action
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Measurable sustainability outcomes assessed:

- Ultra-precise environmental and health sensing
- Improved navigation, medical and climate measurement
- Earlier detection of hazards and change
- Calibration, scalability and cost 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	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. North America and Europe lead quantum-sensing R&D; Asia Pacific scales instrumentation; other regions on their own merits.

MARKET OVERVIEW

From lab demonstrators to fielded, quantum-grade precision sensing.

Quantum sensing is the nearest-term commercial wing of the quantum economy. Demand is driven by GPS-denied navigation, biomagnetic medical imaging, mineral and energy exploration and precision timing for telecom and finance. The market is read three ways — value, deployed units and sensing channels — and forecast under four scenarios (conservative, base, accelerated and disruption), each region reported separately.

- **North America leads commercialisation** — anchored by the United States, where QuSpin, AOSense, Vector Atomic and Infleqtion drive magnetometry, timing and inertial sensing.
- **Europe anchors precision metrology** — with Germany, France, Switzerland and the UK advancing Bosch, Thales, Qnami and Cerca Magnetics.
- **Asia Pacific scales adoption** — as Australia and Japan combine Quantum Brilliance and national timing programmes with strong defence demand.
- **Sensor type and technology segment the value** — across atomic clocks, magnetometers and gravimeters, and cold-atom, NV-diamond and atomic-vapour platforms.

REGIONAL OUTLOOK

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

Region	Stage	Lead Markets & Drivers
Europe	Strong contender	Germany, France, Switzerland, UK — Bosch, Thales, Qnami, Cerca
North America	Market leader	United States, Canada — QuSpin, AOSense, Vector Atomic, Infleqtion
Asia Pacific	Scale engine	Australia, Japan — Quantum Brilliance, defence timing programmes
Latin America	Emerging	Brazil, Chile — mineral exploration, geophysics
Africa	Frontier	South Africa, Morocco — resource exploration, research
Middle East	Frontier	Saudi Arabia, UAE, Israel — defence, navigation, sovereign demand

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
<ul style="list-style-type: none"> • GPS-denied & resilient navigation demand • Biomagnetic medical imaging (MEG, MCG) • Defence, security & sovereign programmes • Precision timing for telecom & finance • Miniaturisation & chip-scale integration 	<ul style="list-style-type: none"> • High cost vs classical sensor incumbents • Size, weight & power (SWaP) constraints • Calibration, drift & field-ruggedisation • Fragmented standards & validation gaps • Niche volumes limiting economies of scale

SEGMENTATION SNAPSHOT

By Sensor Type	Atomic clock · magnetometer · gravimeter / inertial
By Technology	Cold-atom · NV-diamond · atomic vapour
By Component	Sensor head · laser / optics · control electronics · software
By Application	Cold-atom · NV-diamond · atomic-vapour use cases
By End User	Defence · healthcare · navigation · energy & resources · research
By Deployment	Lab / fixed · portable · chip-scale embedded

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 — Quantum Sensors
- › 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

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- › Chapter 12. North America Market Intelligence
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Part IV — Technology, Innovation and Category-Specific Intelligence

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

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

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- › 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 defence primes, precision-instrument makers and quantum-sensing specialists.

Representative players profiled in the full report:

Microsoft Corporation · Honeywell International Inc. (Quantinuum Ltd) · QuSpin Inc. · Q-CTRL Pty Ltd · ID Quantique SA · and 20+ further profiled players across quantum-sensing and precision-instrumentation innovators.

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

KEY QUESTIONS THIS REPORT ANSWERS

- ? How large is the global quantum sensors market, and how fast will it grow to 2032?
- ? Which regions, countries and segments offer the strongest risk-adjusted opportunity?
- ? How does quantum-limited precision change sensing value versus classical instrumentation?
- ? 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, circular-economy and resource-security 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 verdict in a single architecture.

- **Triangulated sizing** — every market read three ways (value, deployed units and sensing channels) so value-led and volume-led 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 deep-tech / PE funds, quantum-sensing firms, defence, medical and research users, OEMs and integrators, regulators and lenders, 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.