Hybrid Classical-Quantum Computing Servers

ANMD-MRS24-240 · 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

Hybrid classical-quantum computing servers fuse QPUs with GPUs and CPUs in a single rack — spanning QPU + GPU/CPU servers, quantum-HPC bridges and co-located racks that integrate superconducting, trapped-ion and photonic processors into supercomputing centres. This report is a comprehensive, decision-grade study of the hybrid-server market across system type, QPU modality, application, end user and deployment model, spanning history 2020–2024, a 2025 base year, a 2025–2032 forecast and long-term outlooks to 2035, 2040 and 2050.

SUSTAINABILITY & SDG IMPACT — THE ANMD LENS

The sustainability case is grounded in efficiency and discovery. Hybrid servers concentrate compute for materials, energy and optimisation breakthroughs while sharing classical-HPC cooling and power infrastructure. The analysis applies double materiality, maps outcomes to GRI, SASB, ISSB, TCFD, TNFD, CSRD and the EU Taxonomy, and links contributions to SDGs 9, 4 and 7. Cryogenic and data-centre energy, embodied carbon and responsible-innovation governance are treated as material risks — with greenwashing and SDG-washing screens applied throughout.

Mapped Sustainable Development Goals:

SDG 9	SDG 4	SDG 7
Industry & Innovation	Quality Education	Affordable Clean Energy

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

MARKET OVERVIEW

Hybrid quantum-HPC integration is the practical path to near-term quantum value.

Demand is driven by supercomputing-centre adoption, the GPU-quantum bridge and variational algorithms that need tight classical-quantum coupling. The market is read three ways — value, units shipped and QPU-GPU nodes — and forecast under conservative, base, accelerated and disruption scenarios, with every projection resolved to the 2025 base year and each region reported separately rather than folded into Rest of World.

- North America leads integration, anchored by the United States, where NVIDIA Corporation, International Business Machines Corporation, Quantinuum Ltd and Hewlett Packard Enterprise Company drive GPU-quantum bridges and hybrid stacks.
- Europe builds HPC-quantum centres, with France, Germany and Finland advancing Atos SE, ParTec and IQM Finland Oy under EuroHPC quantum integration.
- Asia Pacific and Israel add depth, as Fujitsu Limited, Quantum Machines Ltd and Classiq contribute modality and orchestration expertise.
- System type and QPU modality segment the value, across QPU+GPU/CPU servers, quantum-HPC bridges and co-located racks, and superconducting, trapped-ion and photonic modalities.

REGIONAL OUTLOOK

Across the seven reporting regions, the report separates integration leaders from HPC-quantum builders and emerging markets, profiling named country sub-markets, sovereign programmes and reference-architecture pipelines in each. North America and Europe anchor capability; Asia Pacific and Israel add depth; while Latin America, Africa and the Middle East are assessed on their own merits rather than aggregated away.

Region	Stage	Lead Country Markets & Drivers
Europe	Strong contender	France, Germany, Finland — Atos SE, ParTec, IQM Finland Oy, EuroHPC
North America	Market leader	United States, Canada — NVIDIA Corporation, International Business Machines Corporation, Quantinuum Ltd, Hewlett Packard Enterprise Company
Asia Pacific	Scale engine	Japan, Australia — Fujitsu Limited, regional HPC-quantum programmes
Latin America	Emerging	Brazil, Chile — research-centre integration
Africa	Frontier	South Africa, Egypt — early HPC-quantum engagement
Middle East	Frontier	Israel, Saudi Arabia, UAE — Quantum Machines Ltd, sovereign HPC-quantum

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
• Supercomputing-centre quantum integration • GPU-quantum bridge & low-latency coupling • Variational & hybrid-algorithm demand • Sovereign HPC-quantum programmes • Vendor reference-architecture momentum	• Early-stage integration & standards gaps • QPU immaturity limiting workloads • High cost & facility complexity • Orchestration & software-stack fragmentation • Dependence on QC-hardware progress

SEGMENTATION SNAPSHOT

By System Type	QPU + GPU/CPU server · quantum-HPC bridge · co-located rack
By QPU Modality	Superconducting · trapped-ion · photonic
By Application	Superconducting · trapped-ion · photonic workloads
By End User	Supercomputing centres · research labs · enterprises · government
By Business Model	System sale · integration service · quantum-HPC-as-a-service
By Deployment	On-premise · HPC-centre integrated · hybrid cloud

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 V — COMPANY, COMPETITION, PATENT AND PROJECT INTELLIGENCE

PART VI — SUSTAINABILITY, ESG, SDG, CLIMATE AND NATURAL-CAPITAL INTELLIGENCE

PART VII — SUPPLY CHAIN, POLICY, LEGAL, ECONOMICS AND FINANCE

PART VIII — SCENARIO, FUTURE INTELLIGENCE AND FINAL DUE DILIGENCE VERDICT

PART IX — ANNEXES, DIRECTORIES AND REFERENCE MATERIAL

COMPETITIVE & INVESTMENT SNAPSHOT

The competitive field spans accelerator leaders, full-stack quantum players and HPC integrators. Profiled players include NVIDIA Corporation, International Business Machines Corporation, Quantinuum Ltd, Hewlett Packard Enterprise Company, Fujitsu Limited, Atos SE and IQM Finland Oy. Deal activity — reference-architecture partnerships, supercomputing-centre awards and venture financing — signals a market consolidating around integrated quantum-HPC stacks. Investment intelligence spans venture, corporate-strategic, government and infrastructure finance, culminating in a bankability assessment and investment verdict.

KEY QUESTIONS THIS REPORT ANSWERS

? How large is the global hybrid classical-quantum computing servers market, and how fast will it grow to 2032?
? Which regions, countries and segments offer the strongest risk-adjusted opportunity?
? How do technology and adoption shifts change value versus legacy approaches?
? 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 and natural-capital intelligence and a decision-ready bankability verdict in a single architecture.

- **Triangulated sizing** — every market read three ways so value, volume and installed-base 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 verdict.

WHO SHOULD BUY THIS REPORT

Investors and infrastructure funds, accelerator and HPC vendors, full-stack quantum players, supercomputing centres and national labs, enterprise buyers, policymakers and lenders, and corporate strategy and ESG teams — 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.

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