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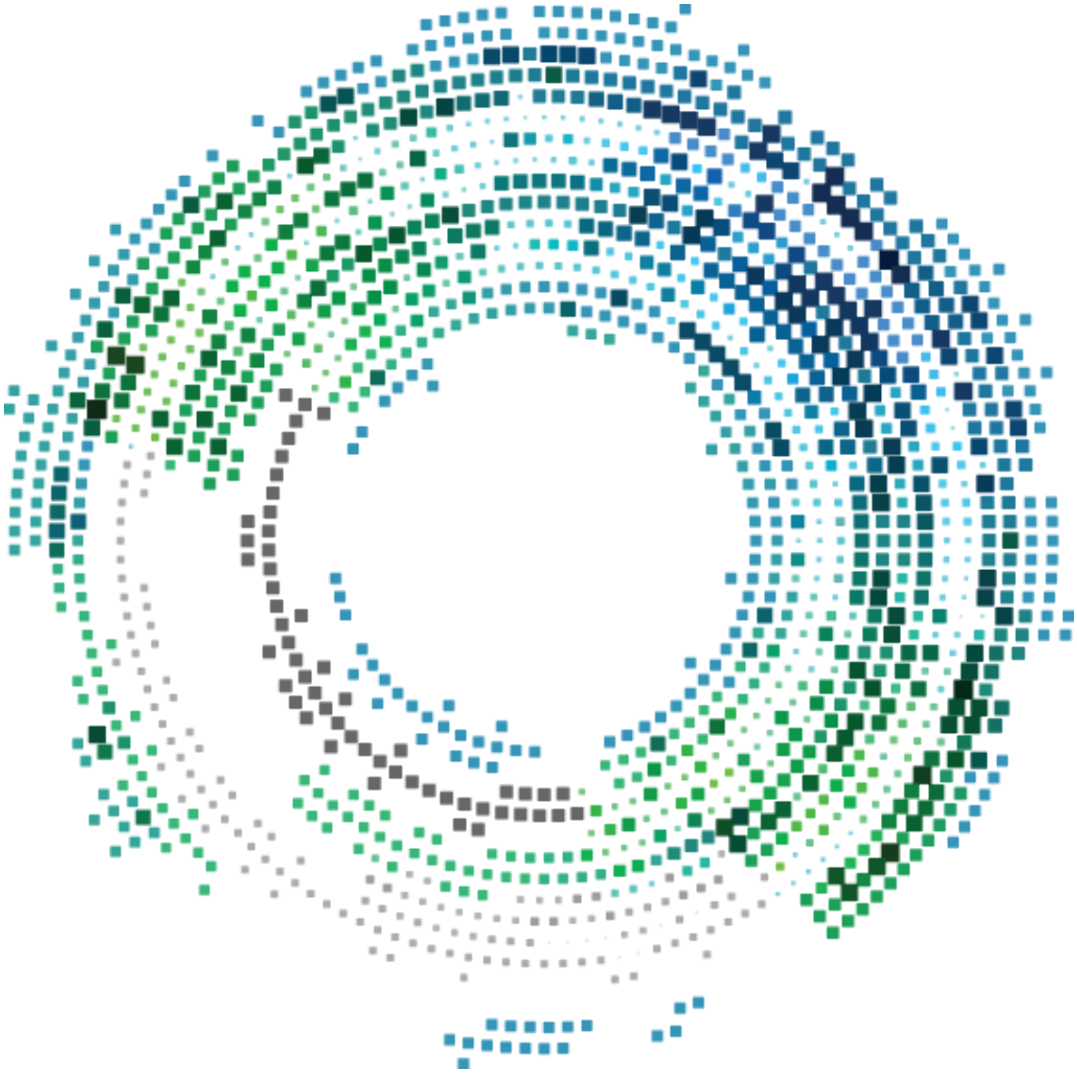
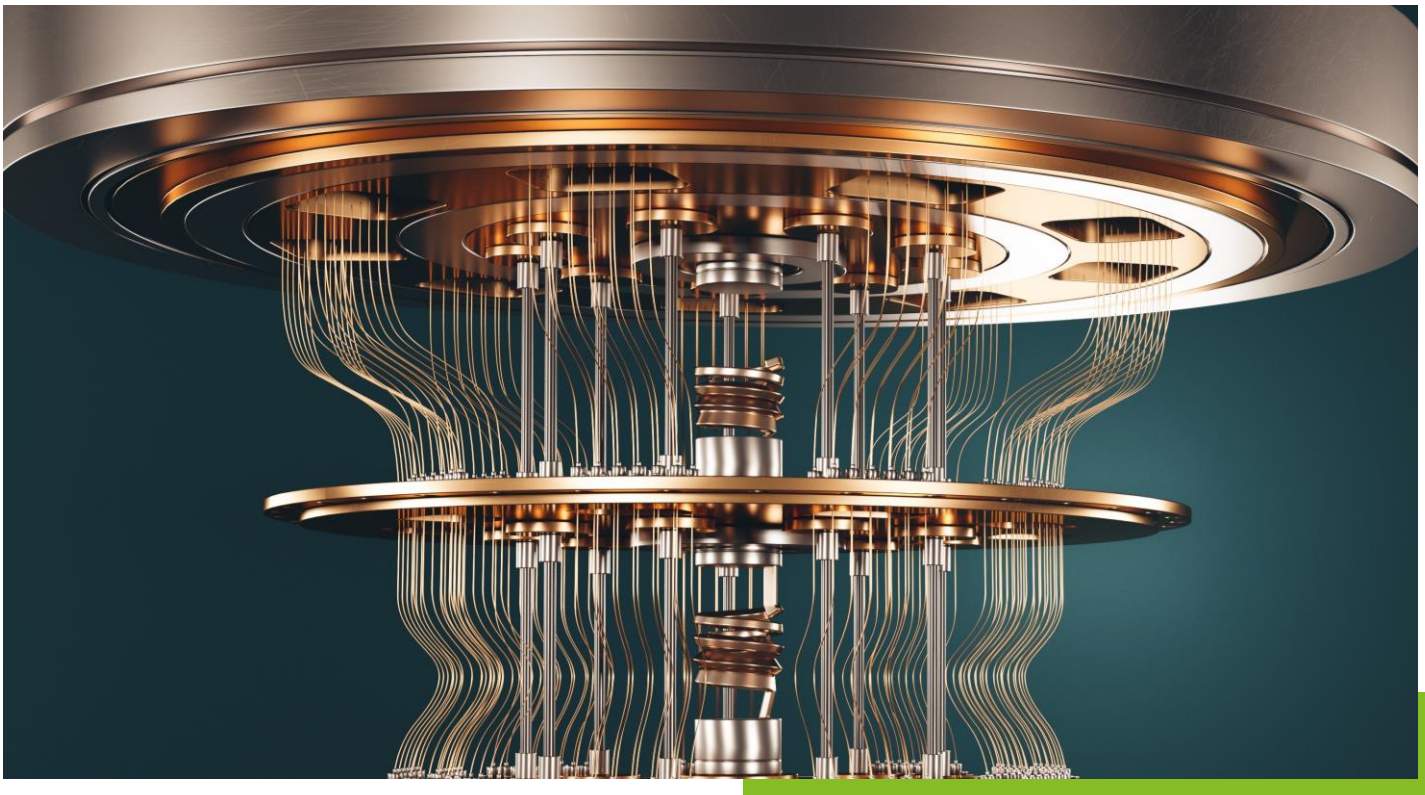


STATE OF PLAY REPORT 2025

DECRYPTING THE LANDSCAPE OF QUANTUM TECHNOLOGIES IN THE APAC REGION

Content



Global and regional investments

The investment landscape has changed significantly in recent years. After two record-setting years of private investments in quantum technologies, sovereign investments have now emerged as the frontrunner. This shift is driven by an increase in sovereign commitments to quantum technologies, fueled by escalating geopolitical uncertainties and an intensified focus on achieving technological sovereignty.

As of 2024, public funding commitments exceed US$40 billion, complemented by US$8 billion in private investment[1].

PRIVATE INVESTMENTS

2023 saw an overall decline in private investments, led by the United States (U.S.), following a record year in 2022. This decrease was largely due to a surge in Special Purpose Acquisition Company (SPAC) activity and larger funding rounds worldwide in 2022. In 2023, global private investments returned to pre COVID-19 pandemic levels, totalling approximately US$1.2 billion in Venture Capital (VC) investments (compared to US$2.4 billion in 2022)[2].

- The **Asia Pacific (APAC) region** maintained a stable growth trend in private investments, accounting for 18% of global private funding with US$217 million invested in 2023.
- **Europe, Middle East, and Africa (EMEA) region** saw a modest increase in private investments (~2.5%), reaching US$781 million. This growth was supported by a diverse funding landscape, including quantum-focused venture capital firms like Quantonation, early-stage deep-tech investors such as OpenOcean, and corporate venture arms like Airbus Ventures.
- The **Americas** experienced a significant decline in venture funding, with investments dropping by approximately 80%, totalling US$240 million.

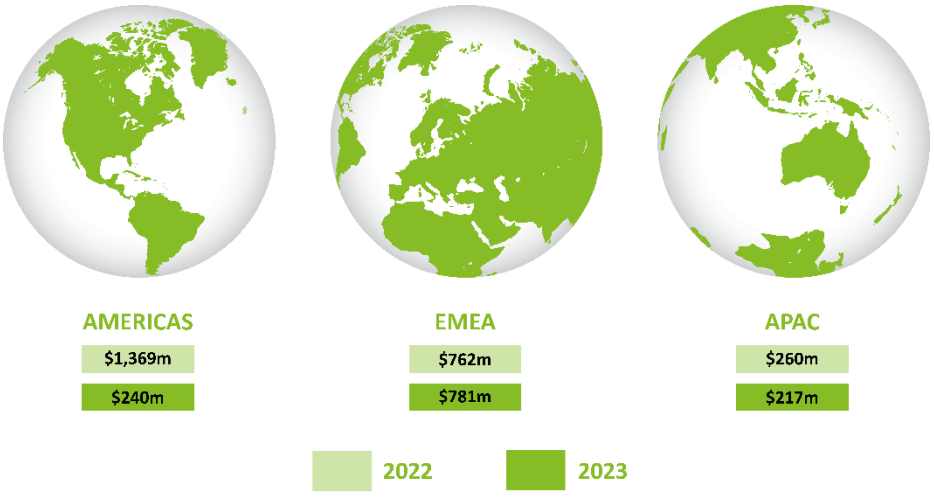


FIGURE 1 | TOTAL PRIVATE INVESTMENT BY REGION (U$MILLION)

SOVEREIGN INVESTMENTS

Globally, an increasing number of governments are implementing sovereign quantum initiatives to drive innovation and maintain technological leadership. The APAC region has made significant sovereign investments, recognising quantum capabilities as critical infrastructure essential for technological independence and the development of a competitive, holistic quantum ecosystem.

Japan was an early adopter in the region, introducing a national quantum strategy in 2020[3], followed by South Korea in 2021[4]. In 2024, Singapore announced a commitment of over US$200 million for the next five years to advance quantum technology research and talent development[5]. Australia has also prioritised quantum innovation with its National Quantum Strategy, launched in 2023, aimed at furthering its globally recognised quantum research and development capabilities. Additionally, Australia's newly established Australian Centre for Quantum Growth provides a centralised point of engagement for the nation's quantum industry[6].

In APAC, China leads with public quantum funding exceeding US$15 billion. The country has established specialised hubs like the Hefei Quantum Centre, which focuses on translating academic research into commercially viable technologies[7].

Quantum technologies, particularly quantum computing, are highly capital-intensive and require long development cycles. Governments will remain pivotal in fostering this ecosystem by mitigating technical and market risks, driving sustained progress, and enabling transformative innovation. Advancing these technologies will necessitate robust collaboration across regions, with alignment on both scientific priorities and geopolitical considerations to work towards effective and harmonious partnerships.

INVESTMENT FOCUS

The majority of global investments have been focused on hardware development, which remains the primary challenge to scaling the quantum industry. One of the most critical challenges is achieving high-quality qubits, as current qubit error rates remain below the necessary threshold for production-ready solutions. Despite the current absence of commercially viable hardware, countries, organisations, and research centres are proactively preparing for the second quantum revolution by enhancing their quantum fluency and exploring practical applications of quantum technology. This shift has brought about the term 'Quantum Advantage', referring to commercially useful quantum computers that have demonstrated the ability to solve real-world, practical problems that cannot be solved classically, or use fewer resources than classical methods.

INNOVATION CLUSTERS | Australia

Australia published its national quantum strategy in 2023 and is fostering a burgeoning innovation ecosystem, featuring world-leading talents and national and global quantum start-ups.

TABLE 1 | ZOOM IN ON THE AUSTRALIAN QUANTUM INVESTMENT LANDSCAPE

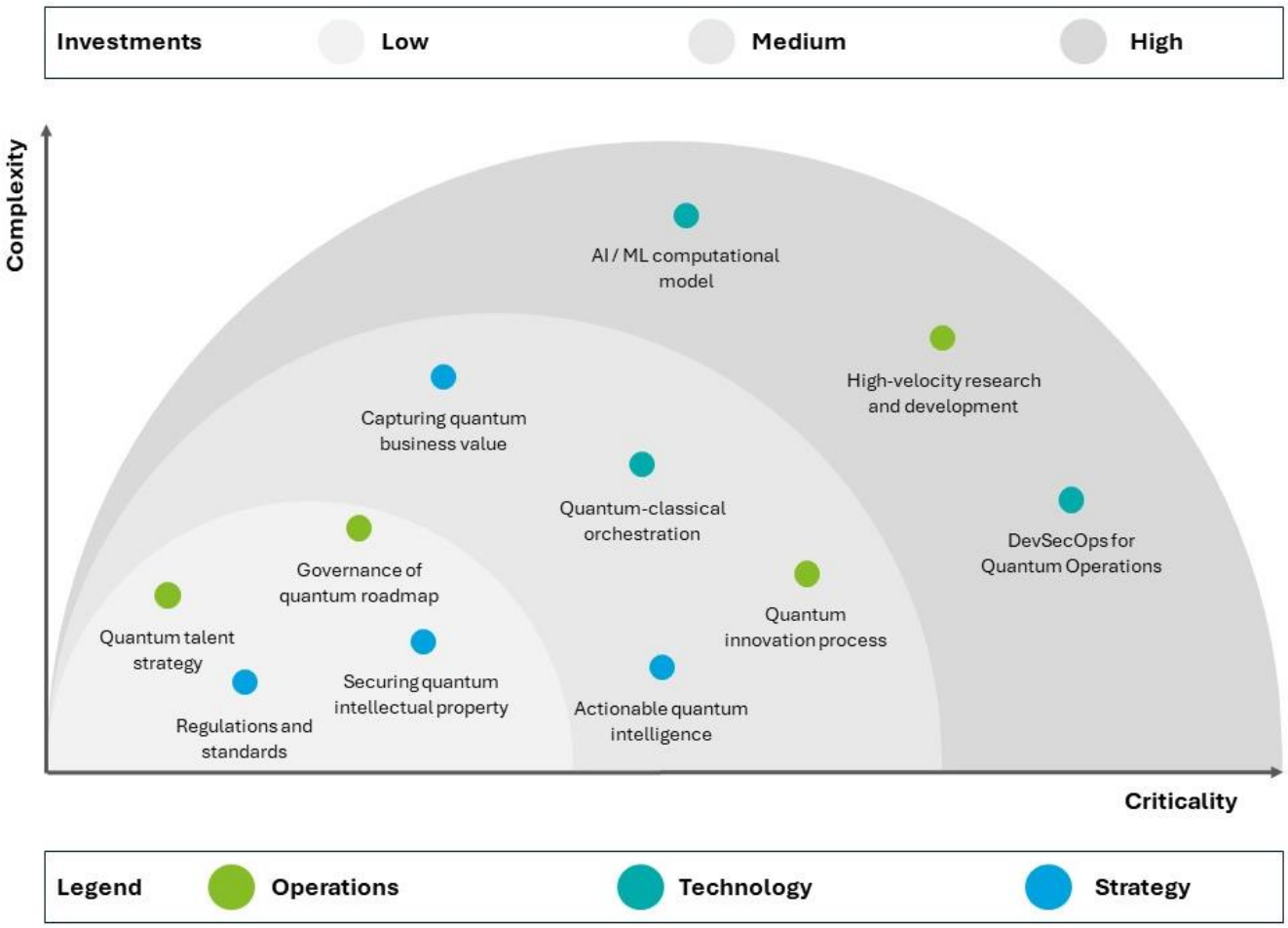
Quantum Company	Last funding round (US$)	Last round date	Funding type	Segment
PsiQuantum[8]	US$620m	April 2024	Public	Quantum Computing
SQC[9]	US$34m	July 2023	Public / Corporate VC	Quantum Computing
Diraq[10]	US$22m	June 2024	VC	Quantum Computing
Quantum Brilliance[11]	US$20m	Jan 2025	VC	Quantum Computing
Infleqtion[12]	US$11m	Dec 2024	Public	Multiple (incl. Quantum Sensing and Communication)
Nomad Atomics[13]	US$10m	July 2023	VC	Quantum Sensing

Exploring quantum technologies

PATH TO QUANTUM FLUENCY

Best practices for preparing organisations for the next generation of quantum technologies have been established. These include conducting active due diligence on the technological advancements, maintaining a use case catalogue, implementing training programmes, and forming strategic partnerships. Frameworks to evaluate quantum readiness are beginning to emerge. For example, IBM has defined the Quantum Readiness Index (QRI), a weighted average index that tracks global quantum readiness across three dimensions: Operations, Technology, and Strategy[14].

TABLE 2 | GUIDE TO THE QUANTUM READINESS INDEX (DELOITTE ANALYSIS)



EXPLORING USE-CASES FOR FINANCIAL SERVICES

In most industries, use cases are now well-established. For example, in September 2024, Deloitte published a market analysis of quantum computing use cases for the financial services sector, highlighting the following[15]:

Top classes of use cases

Use cases	Solution Type	Primary Sector	Description
Derivative Pricing	Simulation	Capital Markets	Simulation to enhance pricing of derivatives, options and CDOs through Value at Risk (VaR) calculations
Liquidity Optimisation	Optimisation	Banking	Optimisation solution that seeks to find the optimal order of transaction processing to maximise the liquidity efficiency for a payment system
Portfolio Optimisation	Optimisation	Investment Management	Optimal solution seeking to maximise return while minimising risk and considering additional factors
Risk Analysis	Simulation	All sectors	Simulation designed to enhance risk analysis of instruments and counterparty credit risk through Value at Risk (VaR).
Supervised Anomaly Detection	Machine Learning	Banking	Machine learning classification task that is trained on labelled cases of fraud/financial anomalies.
Unsupervised Anomaly Detection	Machine Learning	Banking	Machine learning algorithm that does not have labelled training data but learns to identify anomalies.

Additional classes of use cases

Use cases	Solution Type	Primary Sector	Description
Algorithmic Trading	Machine Learning & Optimisation	Capital Markets	Optimisation solution seeking to enhance speed of automated trading platforms to place trades with optimal consideration of timing and/or price.
CAT Modeling	Simulation	Insurance	Simulation solution seeking to increase speed and depth of catastrophic event modeling to increase profitability and customer base.
Collateral Optimisation	Optimisation	Capital Markets	Optimisation solution seeking to find the best mix of bonds to respond to margin calls. This reduces complexity and cost.
Credit Worthiness	Optimisation	Banking	Identification of independent features that are influential in determining borrower credit worthiness.
Episodic Insurance	Simulation	Insurance	Simulation seeking to enhance speed of insurance calculations to allow for individual trip or event-based insurance analysis.
Financial Crash Prediction	Optimisation	Banking	Optimization solution seeking to enhance modeling of financial network for optimized financial crash prediction

PRIORITISATION

While it is possible to outline potential use cases for each sector at a high level, prioritising them remains challenging due to their feasibility being closely tied to the maturity and advancement of the underlying hardware technology. Building a timeline for deploying quantum use cases at scale is similarly difficult but use cases in quantum chemistry are emerging as the most promising for near-term commercial applications.

Experimenting with quantum technologies

CLOUD VS ON PREMISE ACCESS

While cloud-based access to quantum computers remains the most prevalent approach, investments in on-premises quantum computers have recently surged. This surge is primarily driven by concerns over information security, extensive computational needs, and the necessity for immediate and uninterrupted access. As of 2024, global spending for on-premises quantum computing exceeds US$400 million, with over half of this investment directed toward research and development across federal, academic, and commercial sectors and over a third invested in High-Performance Computing (HPC)[16]

QUANTUM TECH IN DELOITTE JAPAN | Meet Masayoshi Terabe, Chief of Quantum Technology, Deloitte Japan

Quantum computing is rapidly transforming drug discovery, emerging as a “killer application” in this field and drawing the attention of pharmaceutical companies in Japan. Deloitte Japan has been at the forefront, organising a series of Quantum Drug Discovery seminars. These events have successfully engaged a broad spectrum of stakeholders, including medical institutions, pharmaceutical companies, and academic researchers, all eager to explore quantum's potential in accelerating drug development.

Japanese industries are not only advancing local quantum initiatives but are also proactively seeking global collaborations. Deloitte Japan hosted the Canada-Japan Quantum Exchange event in partnership with the Canadian Embassy, fostering cross-border dialogues on quantum innovations. Additionally, the Quantum Globalisation Summit, provided a platform for experts to exchange insights on the latest quantum advancements and foster strategic partnerships. Through these initiatives, Deloitte Japan is playing a pivotal role in shaping the future of quantum drug business and positioning Japan as a significant player in the global quantum ecosystem.

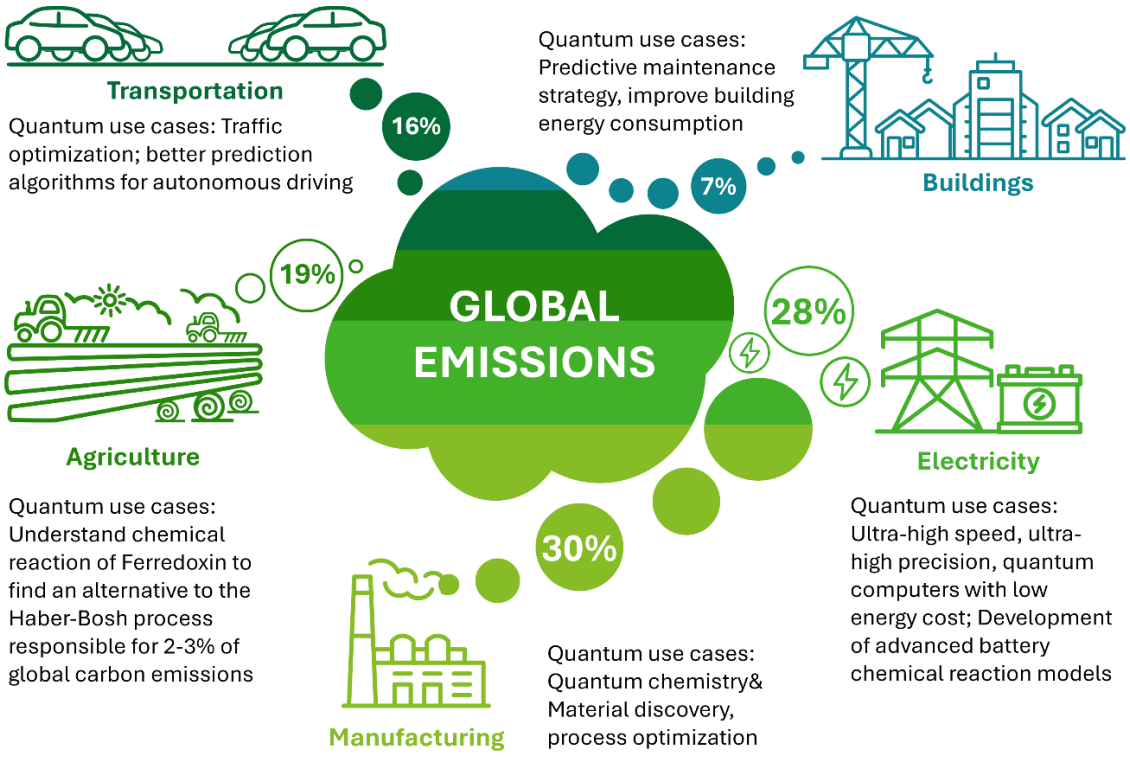
Creating value with quantum technologies

QUANTUM MACHINE LEARNING (QML) VS CLASSICAL ML

QML is a rapidly growing but still nascent field as the understanding on quantum computers for ML applications remain limited. In 2023, QML represents only about 0.67% of all published machine learning papers[17]. Experimentation is essential in the development of ML applications and the lack of computational power at-scale from quantum computers makes empirical tests limited.

QUANTUM x CLIMATE

All global emissions stem from five primary sources: electricity and heat production, manufacturing, agriculture, transportation, and buildings[18]. Quantum computing holds the potential to drive significant reductions in carbon emissions across each of these categories, with varying levels of impact. By enabling advancements in climate technologies, quantum computing will act as a powerful catalyst in the global effort to address climate change.



Source: Breakthrough Energy 2024 Annual Report

Conclusion

Looking forward, the continued shift toward sovereign investments and national quantum strategies will likely drive technological breakthroughs essential for quantum computing to mature. As hardware capabilities evolve, quantum technology will transition from experimental applications to concrete, small-scale production-ready solutions across sectors.

Quantum-enabled advancements in artificial intelligence and climate technologies hold promise for industries seeking to reduce greenhouse gas footprints, improve resource efficiencies, and meet sustainability targets. In the APAC region, national quantum programs continue to make significant investments in advancing the development of quantum technologies, while strategic geopolitical alliances are strengthening efforts to foster a robust quantum ecosystem. These initiatives are driving innovation and positioning the region to set global standards in the field.

Over the next few years, we expect to see an acceleration in APAC's quantum capabilities, driven by public-private partnerships, education initiatives, and infrastructure investments. As organisations prioritise quantum fluency and readiness, the region's quantum landscape will become increasingly sophisticated, establishing APAC as a global hub for quantum-driven solutions, competitive advantage, and technological sovereignty in the quantum age.

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