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Benchmarking Quantum Technology Performance:

Governments, Industry, Academia and their Role in Shaping our Technological Future

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Brussels, 28 March 2025 - The year 2025 has been recognised as the International Year of Quantum Technology. However, considering the rapid advancements and growing interest in this field, it is safe to say that the whole 21st century is shaping up to be the "Quantum Century."

This Policy Brief introduces a new and unique analysis of the quantum performance by governments, universities and the private sector – in China, the United States, and Europe in particular. It is based on a novel Quantum Database developed by the ECIPE team, offering better insight into the performance of key players in the quantum technology space. By analysing the interactions and trends across the public and private sectors as well as academia, this brief provides a comprehensive analysis of the state of the art in quantum technology.

Governments around the world have increasingly recognised the strategic importance of quantum technologies. Our database includes data from over 30 nations that have active government-led quantum technology initiatives. China is currently leading in total investments, followed by the European Union, with Germany alone accounting for 60% of the collective public investments. The United States comes in third. The fortunes reverse when estimating private sector investment in quantum – with the United States far ahead of its peers.

While private sector investments remain unpredictable and still on the rise in many countries, the public sector will continue to play a crucial role in driving the science of quantum technologies – and building capacities for quantum commercial innovation in the future. Still, private funding has experienced exponential growth since the 2010s. As of

2024, our data reveals that the cumulative disclosed funding received or pledged by companies involved in quantum technology worldwide has reached the significant milestone of USD 15 billion.

Europe is positioning itself to compete in the quantum race. The EU has a comparatively big number of companies competing in the global quantum space. In fact, European quantum firms are the most numerous worldwide. However, when comparing the funding by European quantum companies with their international counterparts, the situation looks far less favourable – and Europe needs to complement strong science funding with better growth opportunities for private sector-led quantum developments.

The selection of the US, China, and the EU is not an arbitrary choice. These regions play a critical and strategic role in the global quantum ecosystem, particularly from an academic standpoint. Our policy brief highlights the distinct approaches each region takes: the US prioritises high-impact research driven by its top-tier universities and industry partnerships; China focuses on scale through its state-aligned universities; and the EU balances open scientific research from leading universities in its Member States with the development of specialised, application-driven innovations through cross-country collaboration.

Patents also serve as a key indicator of the accelerating pace of quantum technology advancements. Patent activity has increased by an impressive 58% annually, reflecting the growing innovation in the field. The surge in patent publications related to quantum computing highlights the importance of knowledge diffusion for innovation – once a patent is published, the technical invention becomes publicly available for other inventors and researchers. Our findings show a strong correlation between the surge in quantum inventions and private investment efforts.

This policy brief unveils the current state of quantum technology development. While we have a clear understanding of where each key player stands, it is futile to make prediction of long-term winners and losers, or who might fall behind in the race. What is clear, however, is that quantum success will depend on fostering distributed, decentralised ecosystems rooted in openness, experimentation, and collaboration. The future of quantum technologies will be shaped by many factors but, ultimately, the regions that will thrive are those that adopt a multi-faceted approach to innovation that promotes both competition and collaboration.

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