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Mapping the Quantum Ecosystems: How Are Economies Positioning Themselves for Innovation Success

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Brussels, 30 September 2025 - The newest ECIPE Occasional Paper offers insights into the landscape of global quantum technology collaboration. We analyse more than 18,400 bilateral quantum partnerships between over 4,100 institutions spanning 110 countries from 2018 to 2024. The findings shed new light on how collaborations are shaping the future of quantum technology.

Quantum technologies represent one of the most exciting frontiers in scientific and technological advancement. This study demonstrates that international and industry-involving collaboration is not just beneficial but essential for bringing cutting-edge innovation to market. No single country can pull ahead in isolation; collaboration is key to progress.

The research presents four quantum archetypes, mapping where countries stand in the global quantum ecosystem. **Global Innovation Hubs** (e.g., US and Finland) boast highly interconnected and commercially mature quantum ecosystems. **Research Networkers** (e.g., China and Italy) are deeply woven into global scientific networks but are still building their commercial momentum. **Regional Commercial Leaders** (e.g., Israel and the Netherlands) leverage dynamic startup environments and focused national strategies. Finally, **Emerging Ecosystems** (e.g., UAE and Belgium) are still taking their first steps.

The publication provides recommendations for governments and institutions aiming to lead in quantum innovation. We point out that **collaboration is**

structural: quantum advancement demands a fusion of diverse scientific and engineering talent, and genuine progress is only possible through robust networks that cross borders, sectors, and disciplines. Another key finding is that nearly 60% of private investment has gone to university spinouts, highlighting the **vital role played by institutions that bridge academia and industry**. It is also noticeable how many countries are **leveraging their unique strengths to drive specialised quantum applications**.

"Quantum success depends on building interconnected, open, and specialised ecosystems. To stay competitive, countries should foster quantum ecosystems that encourage industry participation, cross-country collaboration, and that build on their national strengths," says Fredrik Erixon, Director at ECIPE and co-author of the study.

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