Event highlights

Entangled future: Collaborative pathways towards responsible quantum technologies

24 April 2025 | Madrid, Spain

In-person event (by invitation-only)

OECD Global Forum on Technology

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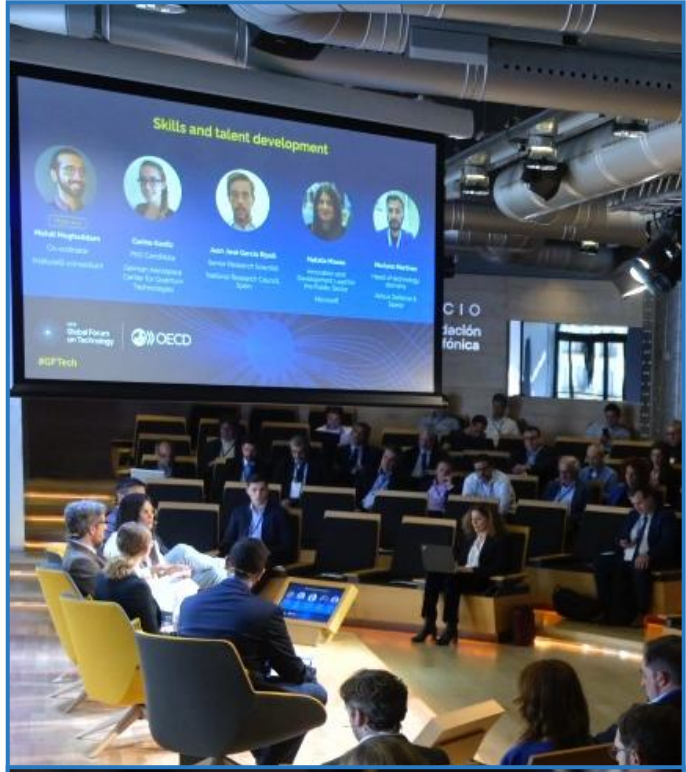
By invitation-only, in-person event held on **24 April** in Madrid, Spain, at Telefónica Foundation.

Over **200 participants** from **30 countries**, including **policymakers**, leading **technology experts** and a variety of **stakeholders** focusing on **quantum technologies**.

Panel discussions on:

- National quantum strategies
- Access an inclusion
- Skills and talent development
- Emerging supply chain specialisations



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Welcome remarks

Mathias Cormann
Secretary-General, OECD

Óscar López Águeda
Minister for Digital Transformation and Civil Service, Spain

Diana Morant
Minister of Science, Innovation and Universities, Spain

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Welcome remarks

- **Opportunities and risks:** Quantum technologies offer not only exciting opportunities but also new risks, including digital security and privacy.
- **Navigating quantum technologies:** The OECD released a new "Quantum technologies policy primer" in January 2025 to support the design and implementation of related policies. It highlights key priorities: boosting investment, building a quantum workforce, and strengthening resilient quantum supply chains.
- **Policy recommendations:** The OECD is developing evidence-based policy recommendations on the responsible development and use of quantum technologies.
- **Spain's new national strategy:** The Spanish government launched its National Strategy for Quantum Technologies at the event, committing over €800 million through 2030.

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Global launch of the Spanish national quantum strategy

- Two ministries involved in science and technology and digital transformation collaborated to create the strategy, outlining **the roadmap from fundamental research to industrial applications**.
- **The strategy indicates seven priority areas** to position Spain at the forefront of the global quantum race.

María González Veracruz
Secretary of State for Digitalisation and Artificial Intelligence, Spain

Juan Cruz Cigudosa García
Secretary of State for Science, Innovation and Universities, Spain

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National quantum strategies

In this session, participants exchanged experiences and lessons in developing, implementing and monitoring strategies of their country.

- **Whole-government approach needed:** Countries face obstacles including skills, infrastructure, access to finance. Governmental efforts that engage the private sector are needed to bridge the gap between research and innovation.
- **International collaboration:** Panelists agreed that countries can't work in isolation. International collaboration on quantum is a must.
- **Next action of national quantum centres:** India, UK, Denmark and Japan have recently established their own national quantum centres as innovation hubs and facility. As a next step, it is important to embed these hubs with research and commercialisation activities.
- **EU strategy in progress:** The EU is currently working with its Member States on an EU quantum strategy, which will be announced in the coming weeks by the European Commission, focusing on all aspects of the quantum ecosystem.
- To watch the recorded panel please click here .

Elizabeth Thomas-Raynaud
Head of the Emerging Digital Technologies Unit
OECD

J B V Reddy
Head of Quantum
Ministry of Science & Technology, India

Josh Fedder
Deputy Head of Quantum
Department for Science, Innovation and Technology, United Kingdom

Masahiro Horibe
Deputy Director
G-QuAT, AIST
Japan

Pascal Maillot
Deputy Head of Quantum Technologies Unit
European Commission

Sofie Lindskov Hansen
Chief Quantum Expert
Ministry of Foreign Affairs, Denmark

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Access and inclusion

This panel explored mutually beneficial collaborations to raise access and support capacity development, including transitional pathways such as quantum education resource-sharing and cloud-based quantum computing services, among other initiatives.

- **Collaboration over competition:** No country can develop quantum technologies alone, so we should inclusively build partnerships among friendly nations.
- **Accessible technology design:** Not every company can afford to keep upgrading its own quantum equipment, and these technologies should not require PhD skills to be operated; we should strive to make technology accessible remotely and in a less complex form.
- **Inclusion of developing countries:** Developing countries participating in forums like this deliver value, in that building up networks can help them overcome invisible barriers that would otherwise cause them to be ignored.
- **Opportunities for gender diversity:** The emerging quantum field, where talent is needed from across disciplines, was identified as one relatively open to women.
- **Attracting and retaining talent:** Countries must build up domestic infrastructure so they can welcome back talent that has gone abroad to receive cutting-edge training.

David Hutchinson
Professor, Department of Physics
University of Otago

Araceli Venegas-Gomez
Founder, CEO
QURECA

Enrico Paringit
Executive Director
Philippines Government Office for Emerging Technology R&D

Marta Pascual Estarellas
Chief Executive Officer
Qilimanjaro Quantum Tech

Paulo Nussenzveig
Professor, Institute of Physics
University of Sao Paulo

Skills and talent development

This panel discussed how governments could anticipate and aid in building the future quantum workforce and how international collaboration could help pool complementary expertise.

- **Skilled workforce development:** The progress of quantum technologies depends on a highly skilled and diverse workforce that can drive innovation and transform theoretical breakthroughs into practical, commercial solutions.
- **Inclusive access:** There is a need to find frameworks to democratize the access to quantum to people that doesn't have a technical background. Opening the ecosystem in a low-barrier, playful, open approach; especially for young people.
- **Online training and collaboration:** Online training programmes for quantum help improve international collaboration without draining talent from a home country.
- **Purpose-driven talent attraction:** Conveying a sense of purpose from working in the quantum industry is an effective way to attract talent.
- **Research-industry mobility:** Facilitating the movement of talent between research environments and industry is important.

Mahdi Moghaddam
Co-ordinator
InstituteQ-consortium

Carina Kanitz
PhD Candidate
German Aerospace Center for Quantum Technologies

Juan José García Ripoll
Senior Research Scientist
National Research Council, Spain

Mariano Martinez
Head of technology domains
Airbus Defence & Space

Natalia Maeso
Innovation and Development Lead for the Public Sector
Microsoft

Emerging supply chain specialisations

This session explored cross-border bottlenecks, complementarities and collaboration opportunities, discussing supply chain perspectives in today's geopolitical context.

- **Supply chain visualisation:** Quantum technology supply chains are immature and emerging. Their visualisation is important due to the inherent complexities, and it is an opportune time to use insights for anticipatory resilience actions.
- **International co-operation:** No country can host supply chains in isolation. Multilateral co-operation is needed to build trust, partnerships and common technology understanding. It can also mitigate sensitivities and vulnerabilities as needed to build the global quantum economy. High-level exchanges can help build robust supply chains and interoperability.
- **Existing infrastructure and barriers:** Many vendors can use existing materials, so leveraging existing supply chains is an opportunity. However, suppliers must evaluate components in special conditions (e.g. near absolute zero temperatures). Equipment and know-how can be barriers to enter the area.
- **Standardisation efforts:** Discussions and debates around standardisation have been ongoing over the last few years. There is consensus around the private sector's need for standards that measure and evaluate the technologies.

Andrés Barreneche
Economist and Policy Analyst,
Emerging Digital Technologies,
OECD

Andrea Rodriguez
Lead, Chair of Governing Board
ImpaQT UA

Diego Rodriguez
Quantum Policy Lead
UK Government Office for Science

Masahiro Horibe
Deputy Director
G-QuAT, AIST
Japan

Ulrich Mans
Strategic Partnerships Lead
Quantum Delta NL

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Closing remarks

Aleida Alcaide

General Director of Artificial Intelligence, Ministry for Digital Transformation and Civil Service, Spain

Elizabeth Thomas-Raynaud

Head of the Emerging Digital Technologies Unit and Global Forum on Technology Lead, OECD

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Closing remarks

- **Timely momentum in 2025:** As 2025 is the international year of quantum, the discussions have been timely and valuable. Moreover, focused and multi-stakeholder contributions are crucial for responsible quantum technology development.
- **OECD policy database:** The OECD's forthcoming work on strategies and policies — highlighting trends and analysing different policy instruments — will be accompanied by a policy database, which will be a living resource made available to support others in considering their strategies and policies.
- **Continuation of OECD policy work:** The OECD will continue to foster dialogue with all the GFTech community and to support co-operation on evidence-based, well-informed policy and anticipatory governance, supporting principles development.
- **Consensus for responsible development:** Multistakeholder and multilateral consensus on what constitutes the responsible development and use of quantum technologies is needed to strengthen trust in collaborations.

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Contact us at **gftech@oecd.org**

More information can be found on our dedicated page
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