Press release

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Harnessing quantum technology for the UN Sustainable Development Goals

GENEVA — Quantum computing is a promising and powerful new tool that could help solve some of the biggest challenges at the heart of the 17 Sustainable Development Goals that world leaders committed to tackle by 2030. GESDA summarizes the challenges and potential of using these emerging technologies in a new paper.

The pandemic, wars in Ukraine and Yemen, and food crises in Africa are among the many factors that have set back progress toward the 17 development goals that the UN General Assembly approved in 2015. A paper by GESDA on the rise of quantum computing, however, shows how its potential to solve problems that are currently unsolvable could help governments make progress on five major UN goals: zero hunger, good health and well-being, clean water and sanitation, affordable and clean energy, and climate action.

"Many of the problems that quantum computers will excel at are directly applicable to implement the Sustainable Development Goals (SDGs) outlined by the United Nations," the paper says. Quantum computers could someday produce greener, cheaper sources of nitrogen-based fertiliser; speed up drug development; develop efficient new membranes for water purification or catalysts that break down toxic contaminants; find new materials for higher capacity batteries, more efficient solar panels and lighter wind turbine blades; and cut carbon emissions in everything from supply chains to transport networks.

IBM, Google, Microsoft, Intel, Baidu are among the biggest corporate players in quantum computing, but younger companies like IonQ, Rigetti Computing and Xanadu in Northern America and Pasqal, OQC, AQT, IQM in Europe are competing, too. The United States are very present in field, but nations such as, Canada, the United Kingdom and China are developing market share. At least 17 nations are working on quantum technology R&D. However, those that control specific resources or core technologies, such as rare earth metals or liquid helium for refrigeration, could take the lead.

How soon might it come to fruition? Predictions vary, the paper notes, but the "general consensus is that we are probably still a decade away, more likely considerably longer." IBM is working on something that may be feasible by 2030, but not many companies and countries can build quantum computers — they're expensive and hard to construct – increasing "the risk that the most socially beneficial use cases will be deprioritised in favour of applications that confer commercial or geostrategic advantages." Yet there is "some overlap" between applications helpful to industry and to accomplishing the SDGs.

And for quantum computing to contribute to fulfilling the UN goals, it also must address "key concerns" over inclusivity, access, public awareness, and ways to measure its impact. Science and diplomacy work done by GESDA in this area will be presented at the upcoming Summit of 12-14 October in Geneva.

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About the Geneva Science and Diplomacy Anticipator Foundation (GESDA)

An independent non-profit foundation under Swiss law and a private-public partnership with the Swiss and Geneva authorities, GESDA was created in 2019 to strengthen the impact and innovation capacity of the international community through science and diplomacy anticipation. For more information, please visit the Foundation's website: www.gesda.global.

For all media and interview requests, please contact GESDA's Communications and Marketing Director Jean-Marc Crevoisier (jean-marc.crevoisier@gesda.global) or Corporate Communications Advisor John Heilprin (john.heilprin@gesda.global).

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