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## Creating impact with Quantum Technologies: Uniper and Terra Quantum to apply hybrid quantum computing in the energy industry

Zurich, Switzerland (ots) -

- In a joint effort, Uniper and Terra Quantum are exploring solutions that could harness the power of hybrid quantum computing to create real world business value
- After assessing quantum computing use cases with Terra Quantum, Uniper has prioritize three use cases:
  - LNG (Liquefied Natural Gas) Logistics Optimization
  - CO2 emissions prediction in biomass plants
  - valuation of options and complex derivatives in energy trading
- With the deployment of tangible use cases, Terra Quantum is the only quantum technology company worldwide looking into production implementation

Terra Quantum, one of the leading quantum technology companies, and the global energy company Uniper combine expertise to explore real world use cases using hybrid quantum technologies. Their joint efforts focus on quantum powered applications in the realms of optimization, machine learning and Monte Carlo simulations (a computerized mathematical technique that allows users to quantitatively account for risk in forecasting and decision-making). The projects investigate potential benefits in LNG scheduling and forecasting, optimizing the operational processes of biomass plants through improving predictions of CO2 emissions and peaks. A further use case can enable faster and more accurate risk pricing in Uniper's trading division.

Quantum technologies have the potential to help us find solutions to some of the world's most complex problems. Uniper has joined forces with Terra Quantum, a leading full-stack quantum technology company, to explore applying cutting-edge technology to notoriously challenging problems in the energy landscape.

Markus Pflitsch, Founder and CEO of Terra Quantum, says: "The energy industry, like many other industries, has a wide variety of optimization, machine learning and simulation challenges which can be impacted by hybrid quantum computing today. We are delighted to be driving this vital industry forward."

### Use cases for proof of concept

#### LNG scheduling and forecasting

In this use case, Terra Quantum and Uniper are tackling complex optimization problems that could enable an enhancement in delivery capacity at lower costs. The hybrid quantum approach aims to build on existing approaches to find improved solutions to complex scheduling problems.

#### CO2 emissions prediction in biomass plants

In this application, a hybrid quantum machine learning (QML) model is being applied to Uniper's operation platform, which already utilizes Artificial Intelligence to optimize processes within biomass plants. This platform analyzes plant data and sensor measurements to predict emissions and peaks. QML could enhance these predictions which would in turn lead to improved optimization of the biomass plant processes, to ultimately reduce emissions and peaks.

#### Valuation of options and complex derivatives in energy trading

A third use case being considered is in using quantum enhanced Monte Carlo simulations to improve the valuation of options and complex derivatives for Uniper's trading division. Monte Carlo simulation is one of the key methods used to understand risk and price complex derivative products in financial markets. Quantum simulation techniques have the potential to significantly enhance Monte Carlo simulation methods by enabling speed-ups.

The organizations are working together in these areas with the aim of probing real world use cases with hybrid quantum technologies, not merely academic problems.

### About Terra Quantum

Terra Quantum is a leading quantum technology company based in Germany and Switzerland. It provides "Quantum as a Service (QaaS)" in three core areas, the first one being "Quantum Algorithms as a Service". Here, customers are provided access to an extensive library of algorithms, such as hybrid quantum optimization and hybrid quantum neural networks, which can be used for solving complex logistics problems or pattern recognition, among other things. Terra Quantum also develops new quantum algorithms for its customers or adapts existing algorithms to their specific needs. Secondly, through "Quantum Computing as a Service", Terra Quantum offers its customers access to its proprietary high-performance simulated quantum processing units

(QPU), the quantum ecosystem's physical QPUs, while also developing native QPUs. The third division is "Quantum Security as a Service," through which Terra Quantum offers its unique solutions for secure quantum and post-quantum communications worldwide. Visit Terra Quantum on LinkedIn and at <https://terraquantum.swiss>.

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