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A cryogenic cooling plant for the world's first utility-scale quantum computer

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Quantum effects have already been in use for a long time: Technologies such as X-rays, transistors, lasers, LEDs etc. are all based on the control of quantum bundles. Today, individual quanta can be manipulated in a targeted manner. Their interconnection into millions of qubits enables the construction of useful quantum computers.. Quantum computing is expected to drive advancements in healthcare, energy, material design, and encryption.
Quantum computers can be based on very different approaches –but what they all have in common is the need to minimize external influences on the state of the qubits or their downstream evaluation, for example through cold. Quantum computers based on superconducting electronic circuits or photonic integrated circuits are considered to be particularly advanced. Both systems are cooled down to deep cryogenic temperatures in several cooling stages.
Linde Kryotechnik has signed an agreement with PsiQuantum to deliver a cryogenic cooling plant for the world's first utility-scale quantum computer in Brisbane, Queensland, Australia. With a total cooling capacity of 36 kW at a temperature of 4.5 K, this system is by far the world's most powerful cooling system in the field of quantum computers and also one of the most powerful cryogenic refrigeration systems ever built. It will cool tens of thousands of PsiQuantum's new Omega photonic chips housed in cabinets that will be networked together with standard optical fiber.

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