

ASX Announcement (ASX:AXE)

12 December 2018

Exclusive licence obtained for breakthrough quantum computing IP

Highlights

- Archer and the University of Sydney Commercial Development and Industry Partnerships (CDIP) have executed an exclusive licence agreement that allows Archer to develop and commercialise room-temperature quantum computing technology.
 - The technology to be developed is a device (chip) capable of quantum information processing at room-temperature, and the materials that would form the critical componentry of the chip are available in the inventory of Archer's wholly owned subsidiary Carbon Allotropes.
 - Successful development of the technology would represent a major global breakthrough in the quantum computing industry, estimated to reach \$US29 billion by 2021¹ and linked to the \$US500 billion² semiconductor market, catalysed by technical advances that allow for practicality, accessibility, and wide-spread consumer adoption³.
 - Patents protecting the licenced intellectual property (IP) have been filed internationally to cover Europe, Australia, United States of America, Japan, Republic of Korea, and China.
 - Archer intends to commercialise the quantum technology once developed through licencing and direct sales channels.
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Archer Exploration Limited (Archer, Company) is pleased to announce that the Company has executed a binding licence agreement (Agreement) with the University of Sydney Commercial Development and Industry Partnerships (CDIP) for exclusive rights to develop and commercialise intellectual property (IP) related to carbon-based quantum computing technology (Licenced IP).

Commenting on the Agreement, Archer CEO Dr Mohammad Choucair said, "We have reached a significant milestone in Archer's history. We now have the means to provide shareholders exposure to the development of a high-impact, globally competitive technology in the area of quantum computing, that aligns strongly with our strategic focus area of Quantum Technology. We are one of very few companies in Australia that can provide that kind of exposure, so we are pleased to have executed the agreement before the end of Q2. It is exciting to think of the possibilities quantum computing can offer and being part of something so revolutionary.

“Currently, the materials used in quantum computers either function at really low temperatures, or if they function at room temperatures, they are extremely difficult to integrate into modern electronics. Simply put, this limits their practicality and use. The IP we have licenced is a potential solution to these problems, and gives Archer a competitive advantage, that of the first mover. Importantly, the materials needed to realise the IP are available in the inventory of our wholly owned subsidiary, Carbon Allotropes”.

The binding licence agreement gives Archer exclusive international rights to develop and commercialise the Licenced IP. The key terms of the Agreement remain confidential. The technology that is the basis of the Licenced IP will need to be realised through development. The Licenced IP has been filed through a patent cooperation treaty (PCT) application by the University of Sydney (University) in the geographic areas covered by a European Patent, Australia, United States of America, Japan, Republic of Korea, and China. Archer has an option to acquire the Licensed IP, following the occurrence of commercial milestones linked to the technology development. Archer may sub-license its rights to the Licenced IP.

Next Steps:

As part of the Agreement, Archer has developed a commercialisation plan (Commercialisation Plan). Over the next 12 months, Archer will exploit the Licensed IP materially in accordance with the Commercialisation Plan. The Commercialisation Plan includes a number of interdependent technical and commercial development milestones in each financial year quarter. Archer is in the process of hiring key personnel to manage the technical development (building the quantum computing processing chip) of the Commercialisation Plan.

The University is responsible for prosecuting and maintaining registration of the patents related to the Licenced IP. The prosecution of the patents in various countries and regions will allow Archer the commercial freedom to operate and market entry to the US, Europe and Australasia. To expedite commercial milestones Archer intends to partner and collaborate with infrastructure providers, software developers, manufacturers, and distributors in the semiconductor industry.

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Background and Market Summary:

Quantum Technology & Archer's Competitive Advantage

Quantum computers represent the next generation of powerful computing³. They consist of a core device (chip) made from materials capable of processing quantum information (qubits) necessary to solve complex calculations⁴. One of the biggest challenges to wide-spread use involves keeping the qubit stable at room-temperature while integrating into electronic componentry. The development of quantum computers is envisioned to impact industries reliant on computational power, including finance, cryptography, digital currencies, and AI.

During his previous employment at the University, Archer CEO Dr Mohammad Choucair invented the first material known to overcome both the limitations of sub-zero operating temperatures and electronic device integration for qubits. The conducting carbon material was able to process qubits at room temperature⁵. This has the potential to reduce the commercial barriers to quantum computing and make it globally accessible. The patented device forms the subject of the Licenced IP.

Market and Key Growth Catalysts

According to McKinsey⁶, in 2015, Australia (5%), the EU (35%), and North America (30%), made up 70% of A\$2.1bn (€1.5bn) world spend on high value quantum computing R&D. Morgan Stanley believes quantum technology could double the value of high-end computers to US\$10 billion by 2027.⁷⁻⁸ Investment bank Goldman Sachs predicts that by 2021, quantum computing could become a \$US29 billion industry¹, while the Boston Consulting Group³ highlighted the dependence of the market size on achieving technical milestones over the coming decades.

Globally, quantum computing forms part of the mature semiconductor and electronic parts manufacturing industry (SEPMI)². The SEPMI is a \$500 billion+ revenue market, with approx. 70% of manufacturing concentrated in Asia. Approximately 40% of costs in the market relate to materials, and the industry sees margins of approximately 10-20%. There are few companies with large market share including Samsung, Intel, and Qualcomm, giving rise to potential opportunities for mergers and acquisitions (consolidation) based on disruptive technology integration.

About Archer

Archer provides shareholders exposure to innovative technologies and the advanced materials that underpin them. The Company has a focused strategy targeting globally relevant advanced materials markets of human health, reliable energy, and quantum technology. Archer is well positioned to execute on its strategy.

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Shareholders

For more information about Archer's activities, please visit our:

Website:
<https://archerx.com.au/>

Twitter:
<https://twitter.com/archerxau?lang=en>

YouTube:
<https://www.youtube.com/watch?v=WZjLG7SrLK8>

¹ Quantum Computers: Solving problems in Minutes, not Millennia. Goldman Sachs. Feb 2018.

<http://www.goldmansachs.com/our-thinking/pages/toshiya-hari-quantum-computing.html>

² Global Semiconductor and Electronic Parts. IBISWorld Industry Report. May 2018.

³ Russo, Massimo, et al. "The Coming Quantum Leap in Computing." BCG Henderson Institute. May 2018.

www.bcg.com/publications/2018/coming-quantum-leap-computing.aspx

⁴ M. Jackson, Singularity Hub, 6 Things Quantum Computers Will Be Incredibly Useful For (2017).

<https://singularityhub.com/2017/06/25/6-things-quantum-computers-will-be-incredibly-useful-for/>

⁵ M. Choucair et al. Nature Communications, volume 7, Article number: 12232 (2016).

<https://www.nature.com/articles/ncomms12232>

⁶ Appears in: <https://www.economist.com/news/essays/21717782-quantum-technology-beginning-come-its-own>

⁷ A Quantum Leap Toward a Computing Revolution. Morgan Stanley. Oct 2017.

<https://www.morganstanley.com/ideas/quantum-computing>

⁸ Quantum Computing – Weird Science or the Next Computing Revolution? Morgan Stanley. Aug 2017.