

ASX Announcement (ASX:AXE)

23 May 2018

## **Archer to enter exclusive negotiations on quantum technology IP with The University of Sydney**

### **Highlights**

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- Archer and the University of Sydney Commercial Development and Industry Partnerships (CDIP) agree to exclusively negotiate terms for an exclusive licence that would allow Archer to develop and commercialise graphene-based quantum computing technology.
- The patent rights are jointly held between the University of Sydney (University) and École Polytechnique Fédérale de Lausanne through a collaborative research project co-led by Dr Mohammad Choucair while previously at the University.
- The negotiations will facilitate the filing of an international patent application by CDIP under the Patent Cooperation Treaty (PCT), as international trade accounts for 96% of revenue in the global semiconductor and electronic parts manufacturing industry<sup>1</sup>.
- The IP has the potential to positively impact the quantum computing industry by developing and integrating critical componentry (qubits) that can operate under practical conditions.
- The development of commercial quantum computing technology would transform computing across multiple sectors including pharmaceuticals, energy, transport, finance and security, with an estimated market size of \$5bn<sup>2</sup> expected to grow exponentially over the next decade<sup>2, 3</sup>.

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Archer Exploration Limited (Archer, Company) is pleased to announce that the Company has entered into exclusive negotiations with the University of Sydney Commercial Development and Industry Partnerships (CDIP) for exclusive rights to develop and commercialise intellectual property (IP) related to graphene-based quantum computing technology.

Commenting on the exclusive agreement, Archer CEO, Dr Mohammad Choucair stated: "There is a need within the quantum computing market to develop componentry that can be integrated into electronic circuitry while remaining functional at room-temperature, allowing

practical non-disruptive solutions that could facilitate the wide-scale point-of-use by consumers. Our negotiations with CDIP will allow Archer to leverage our strategic graphite and graphene resources, and our inventory of specialised materials assets held in our Carbon Allotropes business, to find high value, materials-centric, end-to-end solutions to solve one of the most significant problems in our technological age. It is important to note that Australia has globally recognised expertise in quantum materials and is at the forefront of quantum technology. Archer is in a strong position to develop and commercialise strategically relevant IP for long-term company success and business development.”

The IP relates to the development of a quantum electronic device (QED) for storing and processing quantum bits (qubits) – the fundamental components of a quantum computer. In particular, the QED comprises advanced carbon material components critical for its function, including graphene, which are available in the inventory of Archer’s wholly owned subsidiary, Carbon Allotropes.

The negotiations will be centred on Archer’s exclusive international rights to develop and commercialise IP described in a patent cooperation treaty (PCT) application that was filed by the University of Sydney (University) in the names of the University and École Polytechnique Fédérale de Lausanne (EPFL) as a result of quantum materials and technology research led by Archer CEO, Dr Mohammad Choucair, during his previous employment at the University. The University and EPFL finalised an inter-institutional agreement with which EPFL allows the University to take the commercialisation lead in proceeding to negotiate with Archer.

With respect to the filing of the international patent application, Archer CEO, Dr Mohammad Choucair, commented: “The first written opinion of the international searching authority found that all 16 claims in the PCT were novel and inventive, and the invention can be made by, or used in, industry, respectively. This is the best possible result for the development at this time, and it gives us the confidence to proceed with negotiations with a reduced legal and technical risk at this stage of commercialisation.”

### **Background:**

Quantum computing devices form a strongly growing part of the existing, mature semiconductor and electronic parts manufacturing industry worth an estimated \$540bn<sup>1</sup>. Materials are at the heart of some of the biggest technical and operational challenges in a quantum computing market, estimated to be worth \$5bn<sup>2</sup> and predicted to grow exponentially over the next decade to exceed \$29bn<sup>3</sup>, as technological advancements shift from theoretical foundations to prototype development. This shift includes both hardware (devices) and software, potentially affecting sectors dependent on computational power, including pharmaceuticals, energy, transport, finance and security. Applications for quantum computing across various sectors are emerging, that include artificial intelligence, molecular modelling, cryptography, and financial modelling, where parallel analyses of large data sets, complex calculations, and end-to-end tamper proof signalling are needed.

“We are looking forward to our involvement in the development and commercialisation of this potential breakthrough in quantum computing IP which reduces many of the technological barriers to realising practical quantum computing using solid-state materials. Given the established years of research and results supporting this IP, it has the potential, over a short time frame, to allow Archer to develop and commercialise a world first, practical quantum computing chip (device), with significantly reduced costs compared to current approaches.” Dr Choucair concluded.

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## Shareholders

For more information visit our website

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

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<sup>1</sup> IBISWorld Industry Report. May 2018. Global Semiconductor and Electronic Parts.

<sup>2</sup> Morgan Stanley. August 2017. Quantum Computing – Weird Science or the Next Computing Revolution?

<[https://fa.morganstanley.com/theoberheidegroup/mediahandler/media/77349/Quantum\\_Computing\\_2017\\_08\\_23.pdf](https://fa.morganstanley.com/theoberheidegroup/mediahandler/media/77349/Quantum_Computing_2017_08_23.pdf)> Accessed 23 May 2018.

<sup>3</sup> Goldman Sachs. February 2018. Quantum Computers: Solving problems in Minutes, not Millennia.

<<http://www.goldmansachs.com/our-thinking/pages/toshiya-hari-quantum-computing.html>> Accessed 23 May 2018.