Archer Materials Limited (ACN: 123 993 233)
Ground Floor, 28 Greenhill Road, SA 5034

ASX Announcement (ASX: **AXE**) 9 June 2020

Corporate presentation and strategy overview

Archer Materials Limited ("Archer", the "Company") ("ASX: **AXE**") is pleased to provide the attached presentation for the purpose of outlining the Company's strategic execution priorities.

Archer's investor base has significantly increased in number over the past quarter, almost doubling, and the presentation will provide shareholders with a detailed insight into Archer's key areas of strategic activity.

As the Company continues to grow, Archer staff are now more regularly engaged in discussions with supply chain constituents and potential development and commercial partners ("Partners") across various materials technology industries. Due to the online nature of meetings and the need for virtual roadshows, the presentation provides an effective means for Partners to learn more about the Company, its activities and significant recent developments.

About Archer

A materials technology company developing materials in quantum computing, biotechnology, and lithium-ion batteries, and exploring for minerals in Australia. The Company has strong intellectual property, broad-scope mineral tenements, world-class in-house expertise, a unique materials inventory, and access to over $300 million of technology development infrastructure.

The Board of Archer authorised this announcement to be given to ASX.

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Executive Chairman

Dr Mohammad Choucair
Chief Executive Officer

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

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

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

YouTube:
https://bit.ly/2UKBBmG

Medium:
https://medium.com/@ArcherX

Sign up to our Newsletter:
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/ Company Presentation

ARCHER

Excellence in materials technology.

June 2020

/ Disclaimer

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The material contained in this document is a presentation of general information about the activities of Archer Materials Limited (ASX:AXE) and its related bodies corporate (together the "Archer Group"), current as at the date of this presentation. It is provided in summary and does not purport to be complete. You should not rely upon it as advice for investment purposes, as it does not take into account your investment objectives, financial position or needs. These factors should be considered, with or without professional advice, when deciding if an investment is appropriate. To the extent permitted by law, no responsibility for any loss arising in any way (including by way of negligence) from anyone acting or refraining from acting as a result of this material is accepted by the Archer Group, including any of its related bodies corporate.

This document may contain forward-looking statements with respect to the financial condition, results of operations, and business strategy of the Archer Group. These forward-looking statements are based on estimates, projections and assumptions made by the Archer Group about circumstances and events that have not yet taken place. Although the Archer Group believes the forward-looking statements to be reasonable, they are not certain. Forward-looking statements involve known and unknown risks, uncertainties and other factors that are in some cases beyond the Archer Group's control, and which may cause actual results, performance or achievements to differ materially from those expressed or implied by the forward-looking statements (and from past results). The Archer Group makes no representation or warranty as to the accuracy of any forward-looking statements in this presentation and undue reliance should not be placed upon such statements. Forward-looking statements may be identified by words such as "aim", "anticipate", "assume", "continue", "could", "estimate", "expect", "intend", "may", "plan", "predict", "should", "will", or "would" or the negative of such terms or other similar expressions that are predictions of or otherwise indicate future events or trends. The forward-looking statements included in this presentation speak only as of the date of this presentation. The Archer Group does not intend to update the forward-looking statements in this presentation in the future.

This presentation contains information which was reported in ASX announcements lodged between 1 October 2017 and 8 June 2020 (together the "Announcements"). All material assumptions and technical parameters set out in the Announcements continue to apply and have not materially changed. The Announcements can be viewed online at https://www.archerx.com.au.

Certain statistical and other information included in this presentation is sourced from publicly available third party sources and has not been independently verified.

/ Company Snapshot

Archer Materials Limited
ASX: AXE

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/ Board and Executive Management

Executive Chairman
Greg English
LLB, BE (Mining)

Non-Executive Director
Alice McCleary
DUniv, BEc FCA FTIA FAICD

Non-Executive Director
Paul Rix
B.Com FAICD

Chief Executive Officer
Mohammad Choucair
PhD, FRACI FRSN GAICD

Chief Financial Officer & Company Secretary
Damien Connor
CA GAICD AGIA B.Com

*See Appendix for biographies of Archer's Board of Directors.

Silicon wafer substrates used for Archer's quantum computing chip fabrication at the Research and Prototype Foundry.

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/ Capital Overview

$2.2m
Cash in bank as of 31 Mar 2020

213.4m
Number of ordinary shares on issue

$0.625
Share price (8 Jun 2020)

$133m
Market capitalisation (8 Jun 2020)

6-7x
1-year shareholder return (8 Jun 2020)

28%
Of issued shares held by top 20 shareholders

+ No corporate debt (as of 8 Jun 2020).

Graphene ink produced using materials in Archer's inventory.

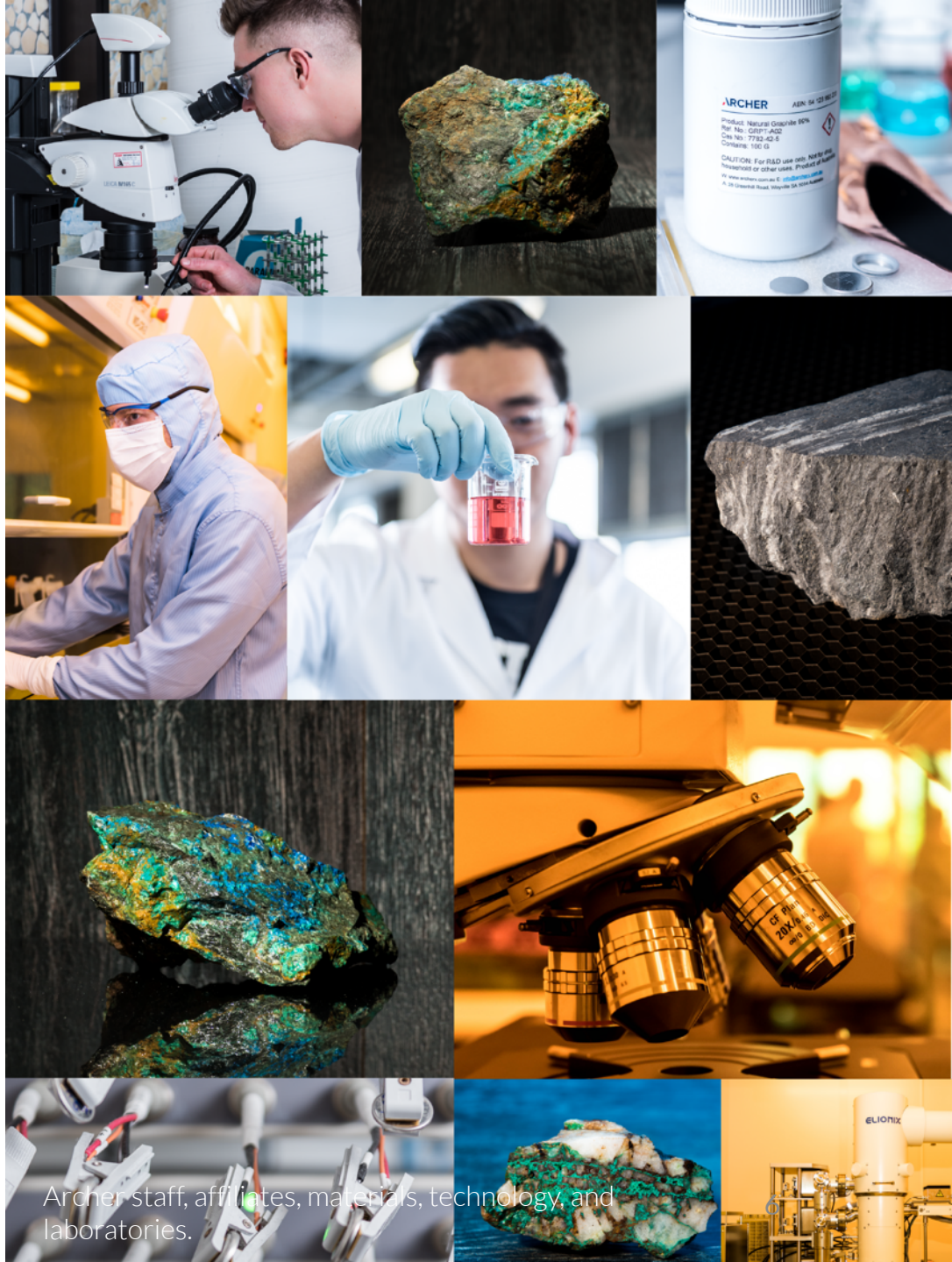
/ Strategy Overview

Archer's growth involves materials discovery and developing innovative deep technology.

Our strategy is to build an industry-leading materials technology company. This involves efficiently developing commercial pathways that maximise shareholder value from assets at various stages of the materials lifecycle.

This presentation is focused on the Company's strategic execution priorities:

+ Building the ^{12}CQ quantum computing chip.
+ Patenting printable graphene biosensors.
+ Integrating anode materials in lithium-ion batteries.
+ Monetising our mineral exploration tenements.



Archer staff, affiliates, materials, technology, and laboratories.

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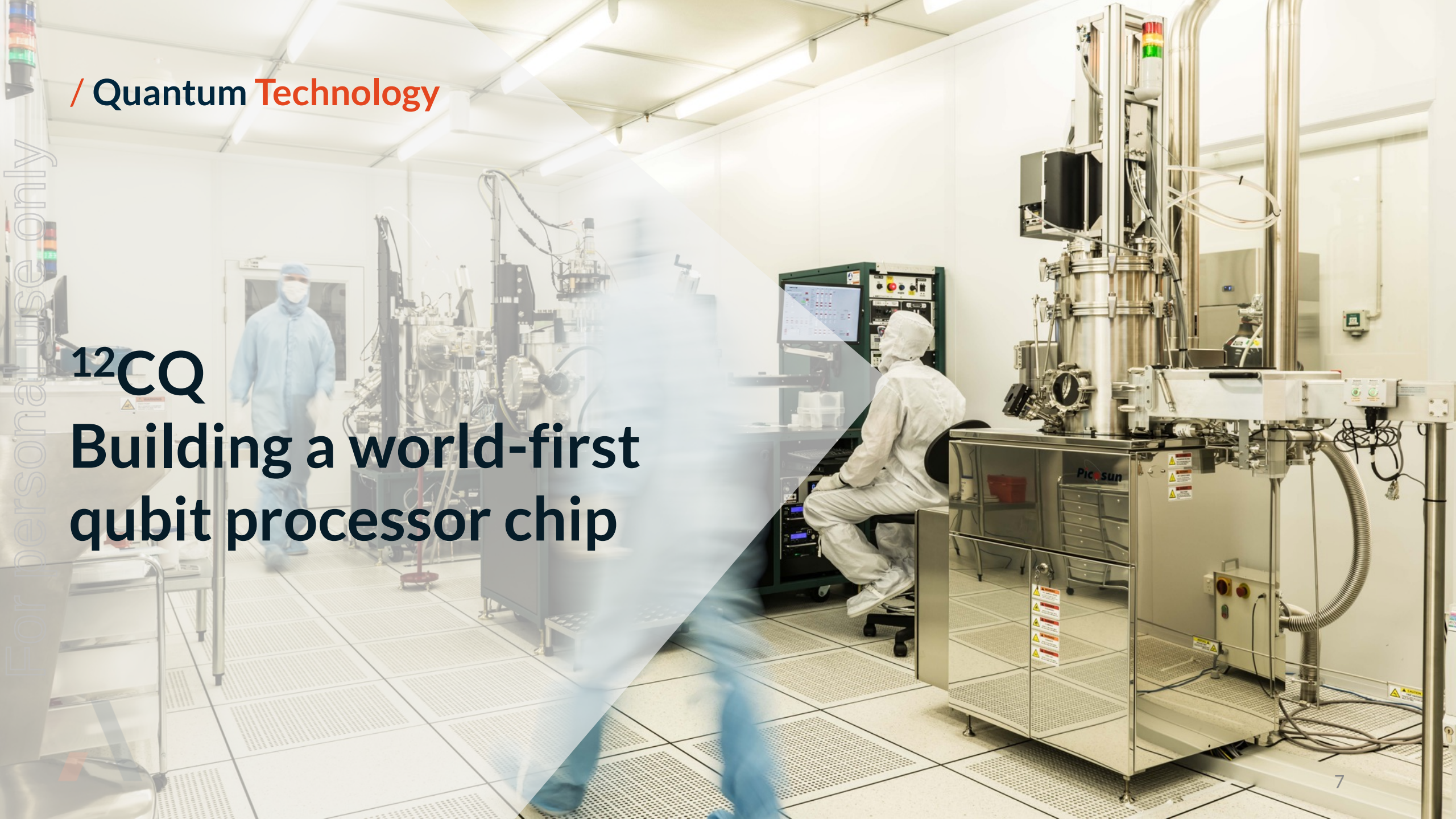
/ Quantum Technology

^{12}CQ
Building a world-first qubit processor chip



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/ Classical Computing vs. Quantum Computing

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$|00\rangle$ Classical bit
is processable information in a binary 0 or 1 state *e.g.* static, electronic signal

$|01\rangle$ Semiconductor materials
are the basis of modern tech, having now reached their atomic limits *e.g.* silicon, transistors

$|10\rangle$ Central processing unit (CPU)
is the device inside computers & phones responsible for performance and function *i.e* processor chip

$|11\rangle$ Modern computing
in smartphones, tablets, & PCs is converging, needing more powerful CPU's *e.g.* functionality

01101100 01110011 00100000
01101001 01100001
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01001100 01101001 01101101 01101001 01110100 01100101 01100100

$$|\psi\rangle = a_\psi|\uparrow_z\rangle + b_\psi|\downarrow_z\rangle$$

$$\sum_{x\in\{0,\ldots,Q-1\};\ f(x)=z} \omega^{xy} = \sum_{b=0}^{m-1} \omega^{(x_0+rb)y} = \omega^{x_0 y} \sum_{b=0}^{m-1} \omega^{rby}$$

$$Pr(|y,z\rangle) = \left|\frac{1}{Q} \sum_{x\in\{0,\ldots,Q-1\};\ f(x)=z} \omega^{xy}\right|^2 = \frac{1}{Q^2}\left|\sum_{b=0}^{m-1} \omega^{(x_0+rb)y}\right|^2 = \frac{1}{Q^2}|\omega^{x_0 y}|^2\left|\sum_{b=0}^{m-1} \omega^{bry}\right|^2 = \frac{1}{Q^2}\left|\sum_{b=0}^{m-1} \omega^{bry}\right|^2 = \frac{1}{Q^2}\frac{\omega^{mry}-1}{\omega^{ry}-1}$$

$|\psi\rangle$ Quantum computing qubit
is processable information in a quantum 'superposition' state *e.g.* electron spin, light, that can be controlled for long times

$|\phi\rangle$ Qubit materials
are the physical basis of quantum computing tech *e.g.* silicon, diamond, limiting operation & temperatures

$|\downarrow_x\rangle$ Qubit processor unit (QPU)
is the most crucial hardware device and brain of a quantum computer, *e.g.* 12CQ, that require fabrication and integration

$|\uparrow_x\rangle$ Quantum computers
represent the next generation of powerful computing & are under development, with limited ownership & use

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/ ^{12}CQ: A Quantum Leap

Archer is well positioned to successfully build & commercialise an operational qubit processor as a potential solution to the widespread use of quantum computing, as:

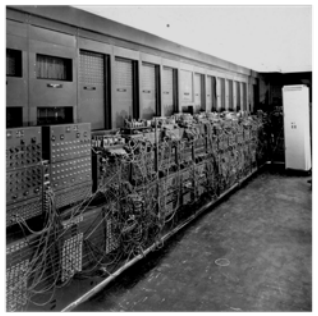
+ Archer is using the only reported conducting qubit material[ƒ] capable of stable and robust quantum information processing at room-temperature: a key barrier to use for any future quantum computing powered consumer devices.

+ A quantum computing agreement[†] signed with IBM, to use Qiskit as the software for ^{12}CQ processors and participation in the global IBM Q Network[‡] as an ecosystem partner – the first Australian company building a qubit processor to do so.

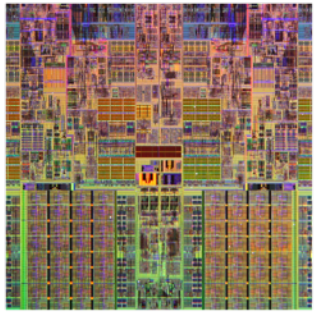
+ Archer has commercial access to the infrastructure, chip foundries, and collaborative partnerships (85+ personnel) needed to build the ^{12}CQ qubit processor chip.

[ƒ] https://www.nature.com/articles/ncomms12232
[†] https://archerx.com.au//src/uploads/2020/05/20200505_Quantum-computing-agreement-with-IBM-ASX-Release.pdf
[‡] https://www.ibm.com/quantum-computing/

Hallmarks of the computing industry.



ENIAC. Copyright Everett Historical Collection.



Die-shot of Intel Core i7 CPU. Copyright Intel Corp.

D-Wave system. Copyright D-Wave Systems Inc. (Media Resources)

1946. Electronic Numerical Integrator And Computer (ENIAC)

1947. Transistor demonstrated to replace the vacuum tube triode

1958. First ever integrated circuit built by Jack Kilby, using Ge and Al

1968. Intel founded by Gordon Moore **(PhD Chemistry)** and Robert Noyce **(PhD Physics)**

1975. Microsoft founded by Bill Gates and Paul Allen

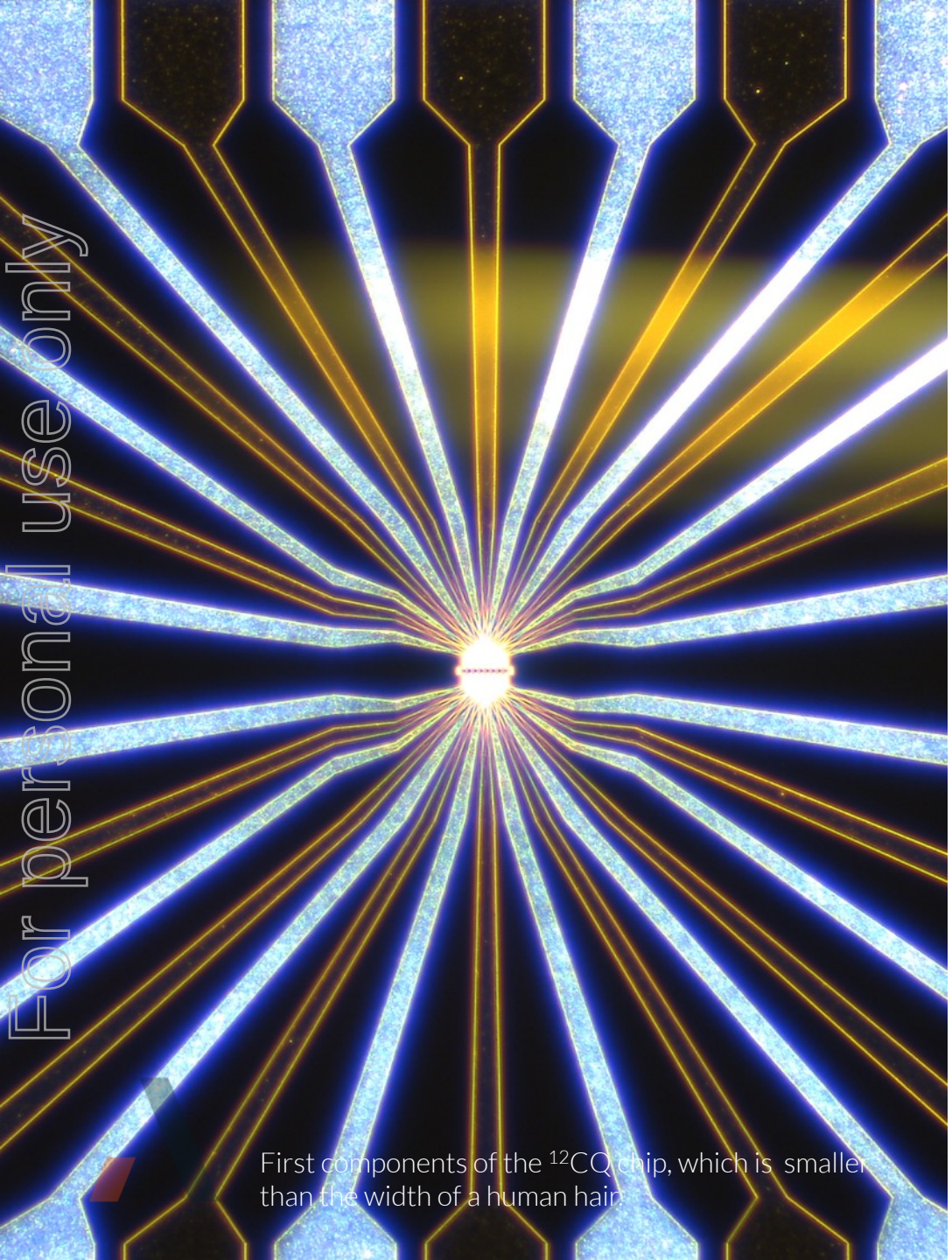
1976. Apple Computer Company founded by Steve Jobs, Steve Wozniak and Ronald Wayne

1980s. The start of the personal computer (PC) era and home gaming consoles

1990s. The internet is invented and portable devices offer unprecedented connectivity

2010+. Quantum computing systems and prototype processor chips emerge

2019. Billions of transistor structures inside a CPU in mobile devices



First components of the ^{12}CQ chip, which is smaller than the width of a human hair.

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/ Generating Value

According to BCG†, Goldman Sachs‡, and the CSIRO§, value for investors in the multi-billion dollar quantum computing economy is expected to increase rapidly as the commercial viability of quantum hardware matures:

+ The quantum economy critically depends on hardware (e.g. qubit processors), of which there are few players.
+ Current qubit processor chips are in early-stage development & limited in algorithms that can be applied.
+ Early movers are in a better position to seize a large share of the total value generated.
+ Expected phases of quantum computing maturity include: *NISQ era* (2-5 years), *broad quantum advantage* (10+ years), *full-scale fault tolerance* (20+ years).

† https://www.bcg.com/en-au/publications/2019/quantum-computers-create-value-when.aspx
‡ http://www.goldmansachs.com/our-thinking/pages/toshiya-hari-quantum-computing.html
§ https://www.csiro.au/en/Showcase/quantum/

/ Quantum Technology Management

Dr Mohammad Choucair *FRACI FRSN GAICD*. Archer CEO since Dec 2017. PhD in Chemistry (UNSW). Alumni of AGSM UNSW Business School. Inventor of the ^{12}CQ quantum computing technology. Former World Economic Forum Global Councillor. RACI Cornforth Medallist for the most outstanding Chemistry PhD in Australia. Honorary Fellow of the University of Sydney.

Dr Martin Fuechsle. Archer Quantum Technology Manager since Feb 2019. PhD in Physics (UNSW). 10 years experience in building quantum computing devices and technology. AIP Bragg Gold Medallist for the most outstanding Physics PhD in Australia. Inventor of the single-atom transistor. Honorary Associate of the University of Sydney.

Dr Mohammad Choucair (left) and Dr Martin Fuechsle (right).

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Microscope image of the Archer & ^{12}CQ logos nano-fabricated with patent application number on chip.

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/ Commercialisation Pathway

Archer's ^{12}CQ chip is a step-change quantum computing technology and in the current stage of development maintains a competitive advantage that is extremely difficult to erode:

+ Archer has exclusive rights to develop and commercialise the IP underlying the ^{12}CQ chip technology.
+ Patent applications are currently undergoing international prosecution in the EU, US, Australia, China, Japan, Hong Kong, and South Korea.
+ Archer's technical leadership in nanotechnology, materials chemistry, and quantum physics is overcoming substantial barriers to quantum computing adoption.
+ Archer intends to develop a qubit processor chip that can be directly sold and the intellectual property rights to the chip technology licensed.

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Printable graphene biosensors

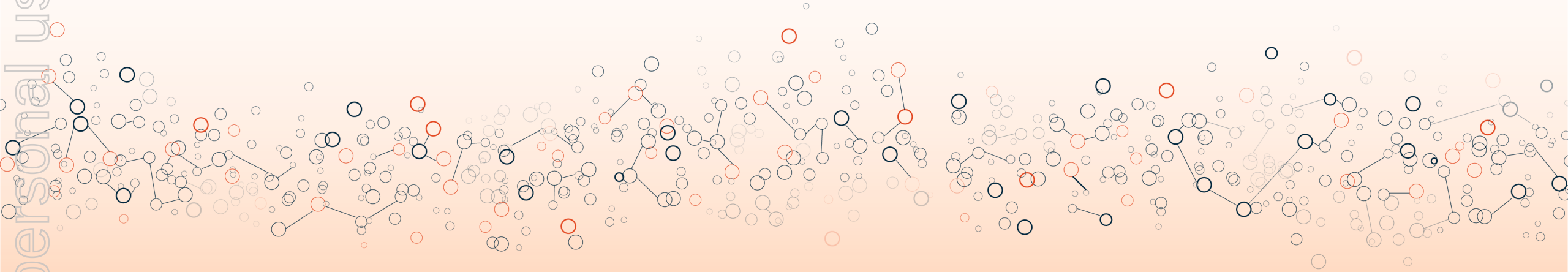
/ Biosensors for *In-vitro* Diagnostics

Biosensors as IVD Devices
Some of the most successful biosensors include tests for pregnancy and blood glucose

IVD Specimens
Taken from the body & used for testing directly (on-device) or in a lab

Patient Wait Times
Biosensors can reduce patient wait times, bypassing traditional IVD infrastructure

Market & Paradigm Shift
Biosensors decentralise IVDs closer to patients, helping improve disease management for individuals



Biosensor Performance
Linked to materials' optical, electrical, magnetic, and/or chemical properties

Graphene Biosensors
Can provide rapid, highly sensitive and low-cost testing for IVDs

Limited Materials
Few materials available to directly read out molecular-level based bioactivity

Biochemically Ultrasensitive
Graphene is electronically active & biocompatible, disrupting non-portable optical IVDs

*More information on Australian regulations related to IVDs: https://www.tga.gov.au/medical-devices-ivds

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/ Value from the Atom Scale

Archer is developing graphene-based technology by exploiting materials at the atom-scale for potential high-value end uses, including in the multibillion-dollar biosensor industry[#]:

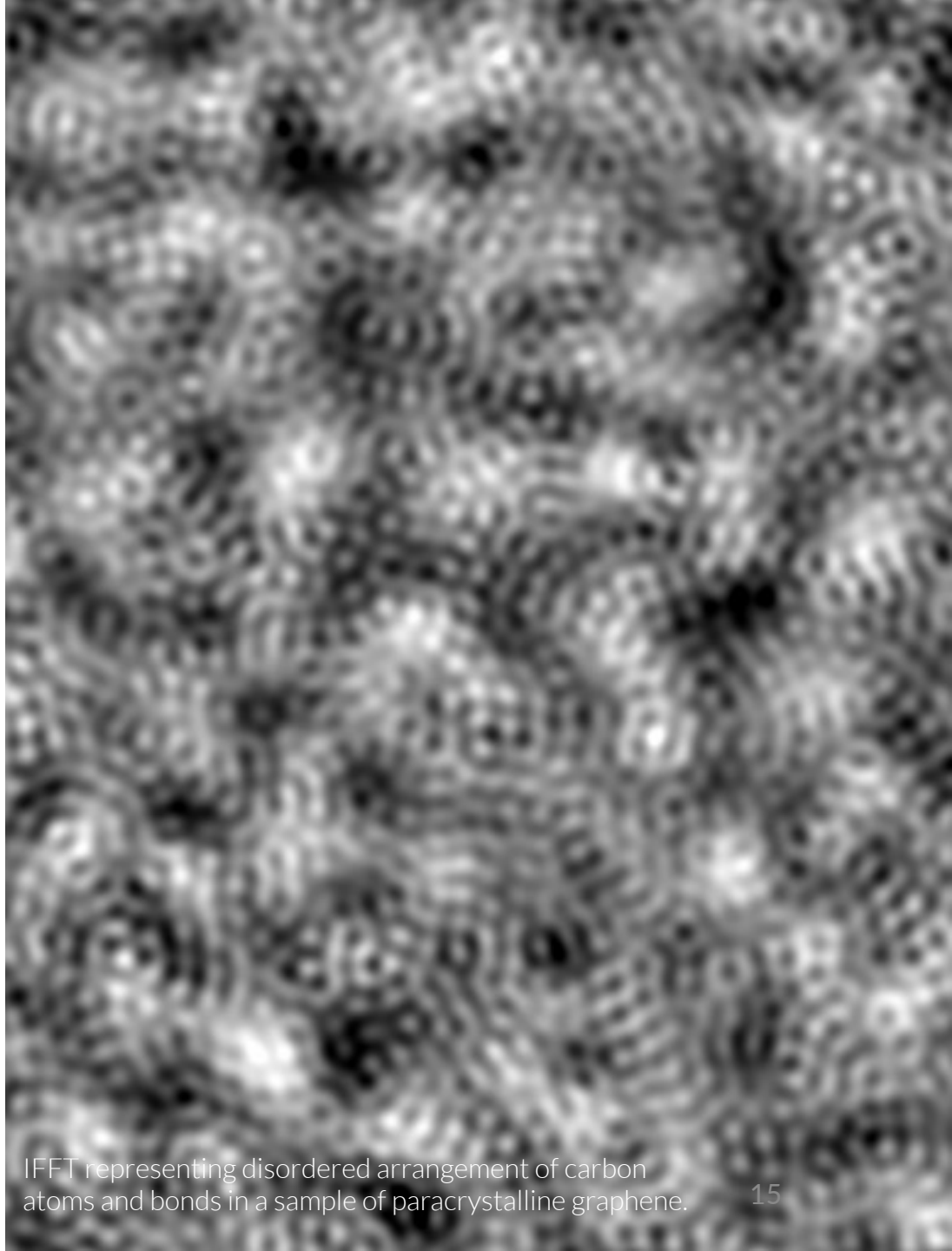
+ There are currently very few materials in existence that can provide biosensing function at the molecular level, and these include silicon and gold, limiting disease detection.

+ The graphene surface is ultrasensitive; biomolecules only a few atoms from the surface of Archer's graphene materials can be accurately detected[§], which is ideal for biosensing.

+ By digitising the manufacture of biosensor componentry Archer is uniquely overcoming key commercial and technological barriers to printable biosensor development.

+ Archer can produce graphene from several chemical feedstocks, including graphite and alcohols.

[#]https://www.weforum.org/events/world-economic-forum-annual-meeting-2020/sessions/biosensors-and-the-future-of-diagnostics
[§] https://onlinelibrary.wiley.com/doi/abs/10.1002/chem.201404309



IFFT representing disordered arrangement of carbon atoms and bonds in a sample of paracrystalline graphene.

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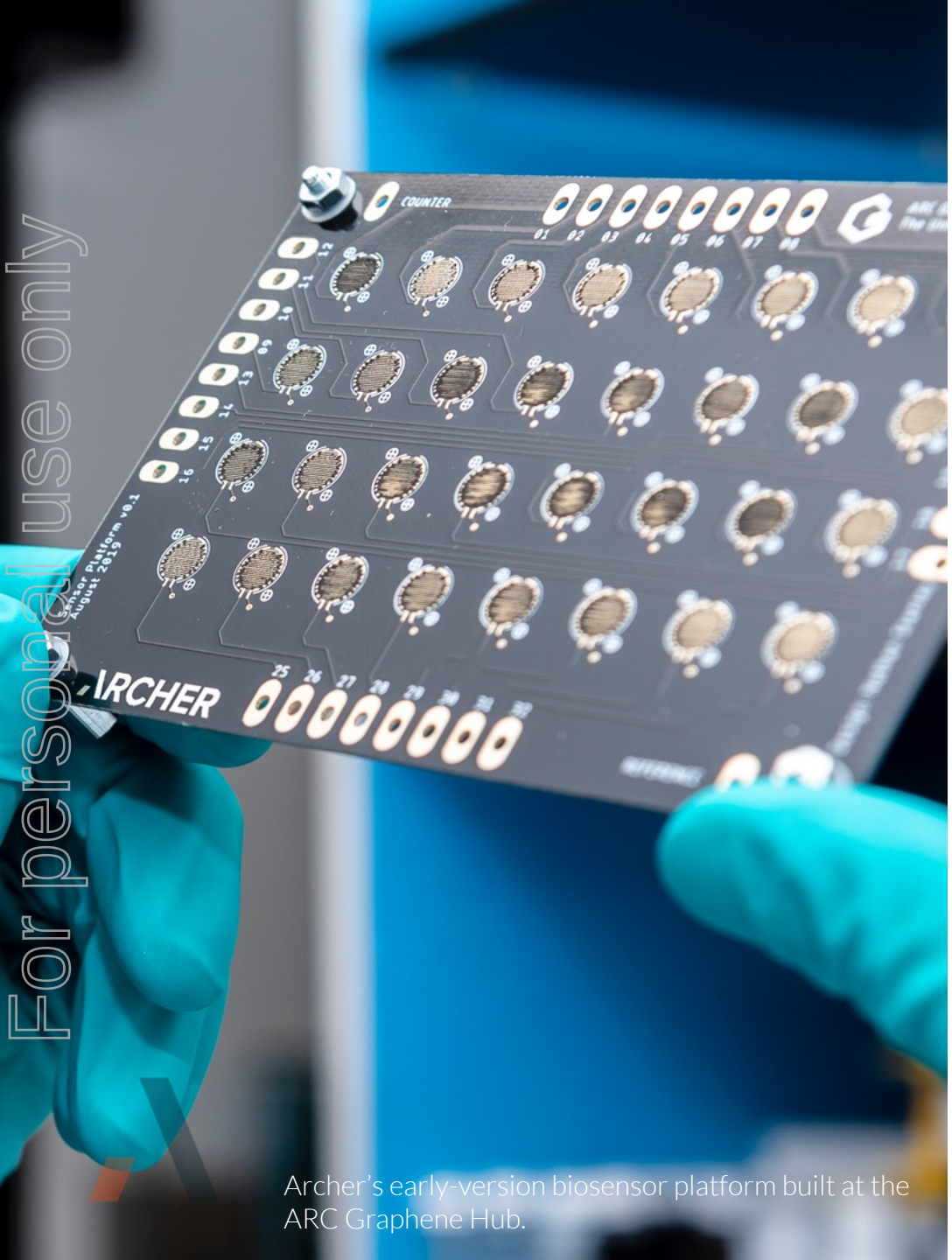

Archer's early-version biosensor platform built at the ARC Graphene Hub.

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/ Commercial Pathway

Archer's strategy involves applying the triple-helix business model[+] for biotechnology innovation to develop printable graphene-based biosensor componentry and sublicense the associated intellectual property rights by:

+ Developing commercial prototype *in-vitro* diagnostic biosensing devices by assembling and testing proprietary graphene-based componentry capable of enabling rapid multi-disease detection and device integration.

+ Filing strong patent applications for prosecution in Australia, the US and EU and to protect the intellectual property rights to the biosensor technology.

+ Establishing commercial partnerships with highly resourced organisations in the biotechnology industry with existing global distribution channels.

[+]https://triplehelix.stanford.edu/3helix_concept

/ Reliable Energy

High-value lithium-ion battery materials

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/ Efficient *vs.* Effective Materials Discovery

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Traditional

Design of Experiment
Ideation in the laboratory with systematic processes to test-and-learn approach

Characterisation
Labour intensive structure elucidation & lab-prototype testing for function

Pilot-scale Testing
Closed systems addressing scalability of process uncertainties

High Volume & Efficiency
Top-down manufacturing & IP generation follwed by rapid commoditisation

Next-generation

Well-defined Materials
High-power computer modelling combined with machine learning

Establised End-uses
Virtual synthesis processes & characterisation for hypothetical functionality

Full System Integration
Testing & validation integrated with full materials' lifecycle assessments

High Value & Effectivness
Bottom-up manufacturing & IP generation follwed by delayed commoditisation

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/ Value in Discovery and Design

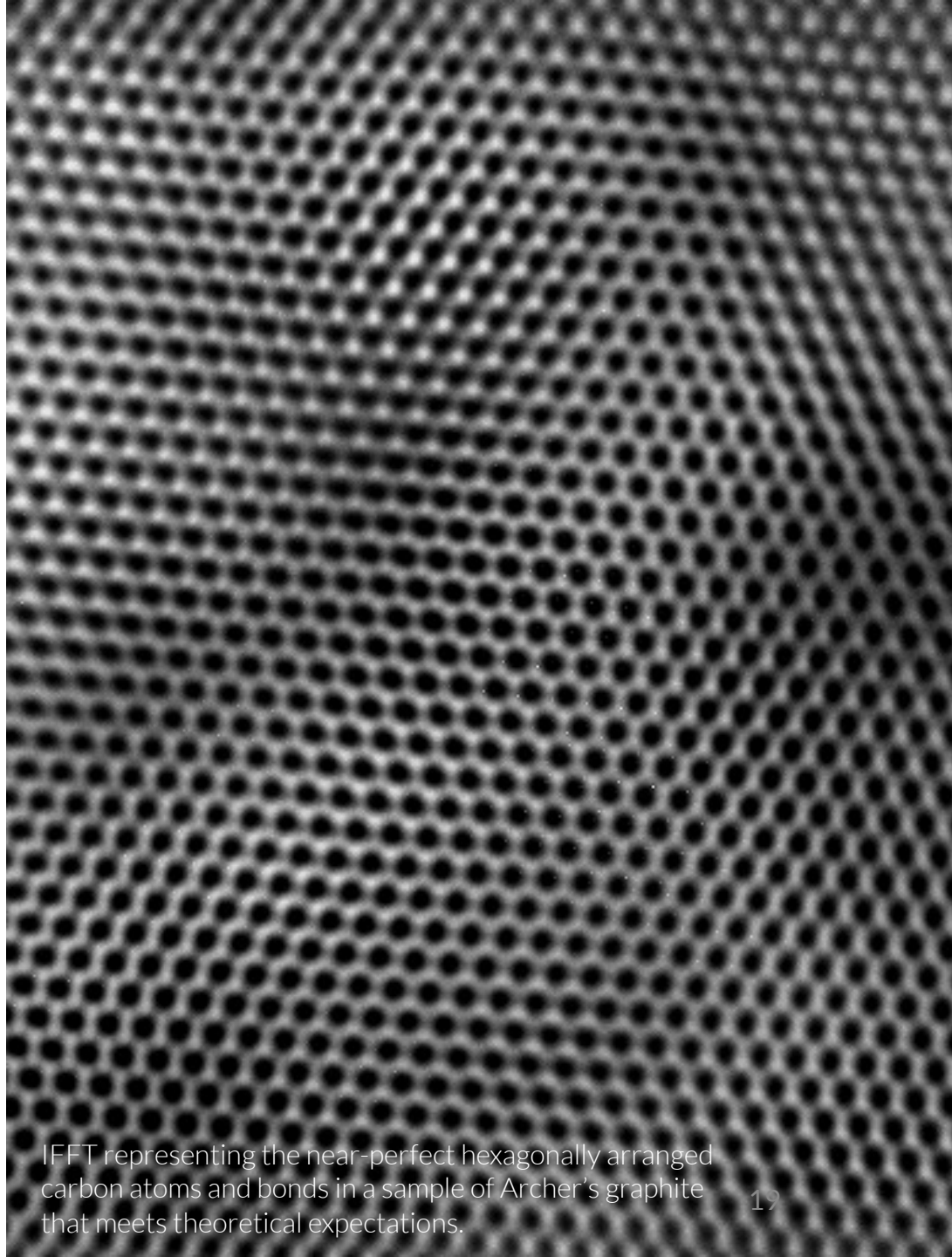
The 2019 Nobel Prize in Chemistry was awarded for the development of lithium-ion batteries, reflecting the significant impact of portable energy storage and use, and the multibillion-dollar industry that it created†:

+ Highly powerful computing is accelerating the discovery and design process of new battery materials that would otherwise have consumed a tremendous amount of time and resources.

+ It is a fundamental global challenge to efficiently determine early-stage materials candidates for integration in batteries from the vast combinations of formulations possible.

+ Archer has begun formulating, building, and testing full-cell lithium-ion batteries using graphite derived anodes with different end-use cathode chemistries‡.

† https://www.idtechex.com/research/reports/li-ion-batteries-2018-2028-000557.asp
‡https://archerx.com.au//src/uploads/2019/08/20190808_Campoona-spherical-graphite-ready-for-battery-optimisation-ASX-Release.pdf



IFFT representing the near-perfect hexagonally arranged carbon atoms and bonds in a sample of Archer's graphite that meets theoretical expectations.

Archer graphite materials used to prepare lithium-ion battery coin-cells.

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/ Commercial Pathway

Our strategy is to apply traditional and next-generation materials discovery schemes to develop materials that meet the minimum performance requirements and market accepted benchmarks for lithium-ion batteries, by:

+ Optimising, creating and testing high value-added anode materials products and processes atom-by-atom using a combination of classical and quantum computing, in real-world full-scale lithium-ion batteries.

+ Establishing partnerships with highly resourced organisations in the energy industry to identify performance trade-offs using new materials, and licencing the intellectual property rights associated with their efficient early-stage discovery.

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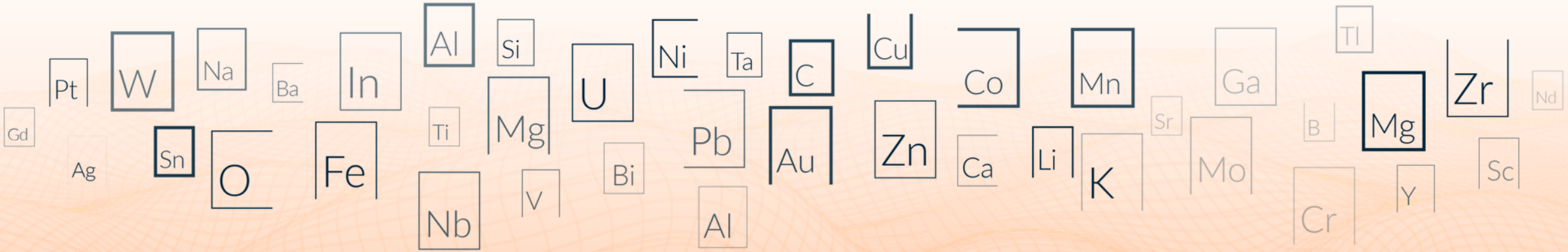
Exploring for critical minerals

/ Australia's Mineral Richness

Exploration is the foundation of all value creation in mining, & the discovery of high-value deposits is crucial to the future of technology development

Australia has some of the world's largest economic demonstrated resources with a global market value of $60bn+ of critical minerals*

Australia is rich in minerals that are critical in securing global supply-chains, with 87%+ of total Australian mining exports going to Asia*



Exploration involves collecting & analysing geological information to identify mineral deposits as well as determining their economic feasibility**

Materials technology companies must think ahead and secure access to critical and strategic minerals & raw feedstocks through exploration***

M&A's and JV's can be a suitable means of monetising the exploration project pipeline and therefore a powerful value generator

*https://www.industry.gov.au/sites/default/files/2019-03/australias-critical-minerals-strategy-2019.pdf
**https://minerals.org.au/exploration
***https://www.bcg.com/en-au/publications/2019/value-creation-mining-return-to-strategy.aspx

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/ Diverse Value Base

Successful exploration of Archer's tenement areas could lead to significant mineral discoveries at various stages of projects' development and risk:

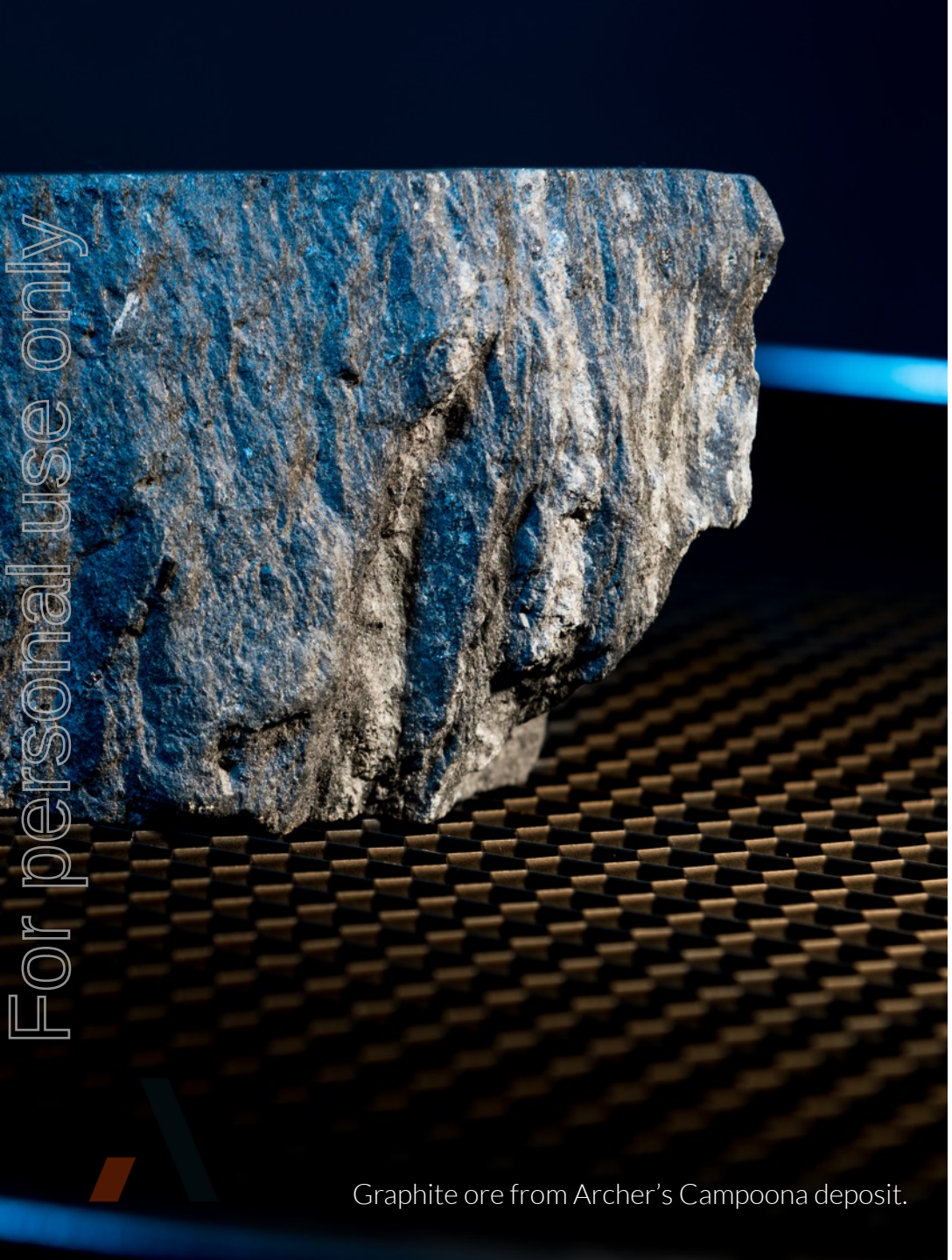
+ Archer has a broad-scope portfolio of tenement interests, maintaining 100% ownership of 20+ mining & exploration licences for a diverse range of minerals in Australia.

+ The Company's exploration spans district to deposit scales with ongoing activity targeting prospective areas for large targets of high-value commodities.

+ Demonstrated effective technical and operational capabilities having managed successful drilling programs to identify geological anomalies and prospective areas defined by intersections of such anomalies†.

†Archer Exploration Limited Annual Report (2019) pages 21 – 31.
https://archerx.com.au//src/uploads/2019/09/Archer-Annual-Report-WEB-small.pdf

Archer rock sample containing copper from Purnamoota.



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Graphite ore from Archer's Campoona deposit.

/ Commercialisation Pathway

Our strategy involves the monetisation of globally in-demand tenements for exploration and mining of economically proven resources for the future development, production and export of critical minerals by:

+ Managing a number of exploration projects to locate ore bodies in Australia that may be mined and provide the necessary data to potential development partners and independent reviewers for the evaluation of prospect viability.

+ Realising value and value-add returns by strategically acquiring new tenements and/or selling the rights to existing tenements; with Archer having successfully sold over $11m in assets since 2012, including to BHP Billiton‡.

‡Archer Exploration ASX Announcement (April 2012)
https://www.asx.com.au/asxpdf/20120430/pdf/425x9jbj97wjcd.pdf

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The Path Forward

/ Company News Flow

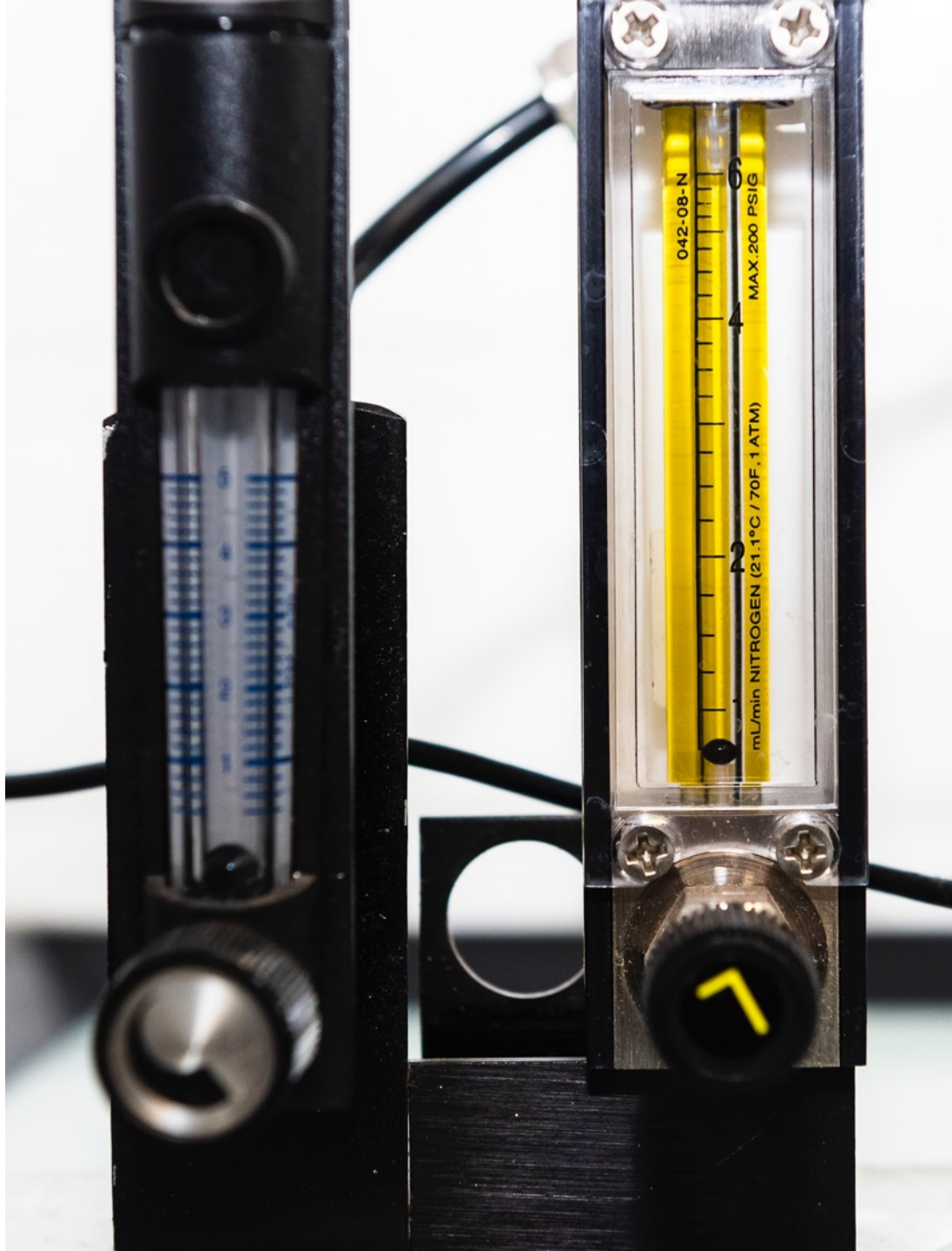
Over the next 12 months key aspects of our strategy to provide shareholder returns include:

+ **Accelerating ^{12}CQ toward commercialisation**
  World-first device componentry assembly and growing Archer's quantum computing supply-chain industry partners.

+ **Patenting & developing graphene biosensors**
  National phase patent application decision points, and development milestones in building proof-of-concept devices.

+ **Integrating materials in portable energy technology**
  Producing high-value IP portfolio of downstream battery materials and identification of co-development partners.

+ **Monetising our mineral exploration project pipeline**
  The effective, timely, and strategic exploration, sale, and acquisition of value-added mineral exploration tenements.



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The Board of Archer authorised this announcement to be given to ASX.

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ACN: 123 993 233

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YouTube: https://bit.ly/2UKBBmG

Sign up to our Newsletter: http://eepurl.com/dKosXI

Appendices

Board and Executive Management (Slide 4)

Greg English *LLB, BE (Mining)*
Executive Chairman

Greg English is the co-founder Archer. He has been Chairman of the board since 2008 and has overseen Archer's transition from a South Australian focussed minerals exploration company to a diverse materials technology company. He has more than 25 years of engineering and legal experience and has held senior roles for Australian and multinational companies. Greg has received recognition for his work as a lawyer in The Best Lawyers® in Australia, 2020 Edition in the area of Commercial Law.

Alice McCleary *DUniv, BEc FCA FTIA FACID*
Non-executive Director

Alice McCleary is a Chartered Accountant. She is Deputy Chair of the Uniting Church of South Australia's Resources Board. She is a former Chairman of ASX Listed Company Twenty Seven Co. Limited (ASX:TSC) and former Director of Adelaide Community Healthcare Alliance Inc. (ACHA), Benefund Ltd and Forestry Corporation of South Australia. Previous leadership roles include Vice-President of the South Australian Chamber of Mines and Energy (SACOME), Deputy Chancellor of the University of South Australia and National President of the Taxation Institute of Australia. Alice's professional interests include financial management and corporate governance.

Paul Rix *B.Com, FACID*
Non-executive Director

Paul Rix was appointed as a Director of the Company on 8 February 2016. Paul Rix is an experienced mining professional with more than 30 years' experience in the marketing of industrial minerals and products. From 2003 – 2013, Paul worked for Queensland Magnesia Pty Ltd (QMAG) as General Manager Marketing where he was responsible for the development and implementation of QMAG's long term marketing strategy, focusing on diversification of magnesia products and markets whilst maintaining high plant utilisation. His magnesia marketing responsibilities stretched across six continents and more than 30 countries.

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Appendices

Board and Executive Management (Slide 4)

Mohammad Choucair *PhD, FRACI FRSN GAICD*
Chief Executive Officer

Dr Mohammad Choucair was appointed Chief Executive Officer on 1st December 2017. Dr Choucair has a strong technical background in nanotechnology, and has spent the last decade implementing governance, control and key compliance requirements for the creation and commercial development of innovative technologies with global impact. Dr Choucair served a 2-year mandate on the World Economic Forum Global Council for Advanced Materials and is a Fellow of both The Royal Society of New South Wales and The Royal Australian Chemical Institute. He has a strong record of delivering innovation and has been recognised internationally as a forward thinker.

Damien Connor *CA GAICD AGIA B.Com*
Chief Financial Officer & Company Secretary

Damien Connor was appointed Company Secretary on 1 August 2014. Damien performs the financial/accounting role in the Company as well as the secretarial duties. Damien has been a member of the Institute of Chartered Accountants since 2002 and is a Graduate of the Australian Institute of Company Directors and a Member of the Governance Institute of Australia. Damien has been employed in the resources sector since 2005. He also provides Company Secretary and Chief Financial Officer services to other ASX-listed and unlisted entities.

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