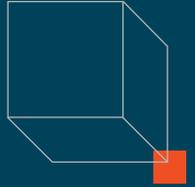
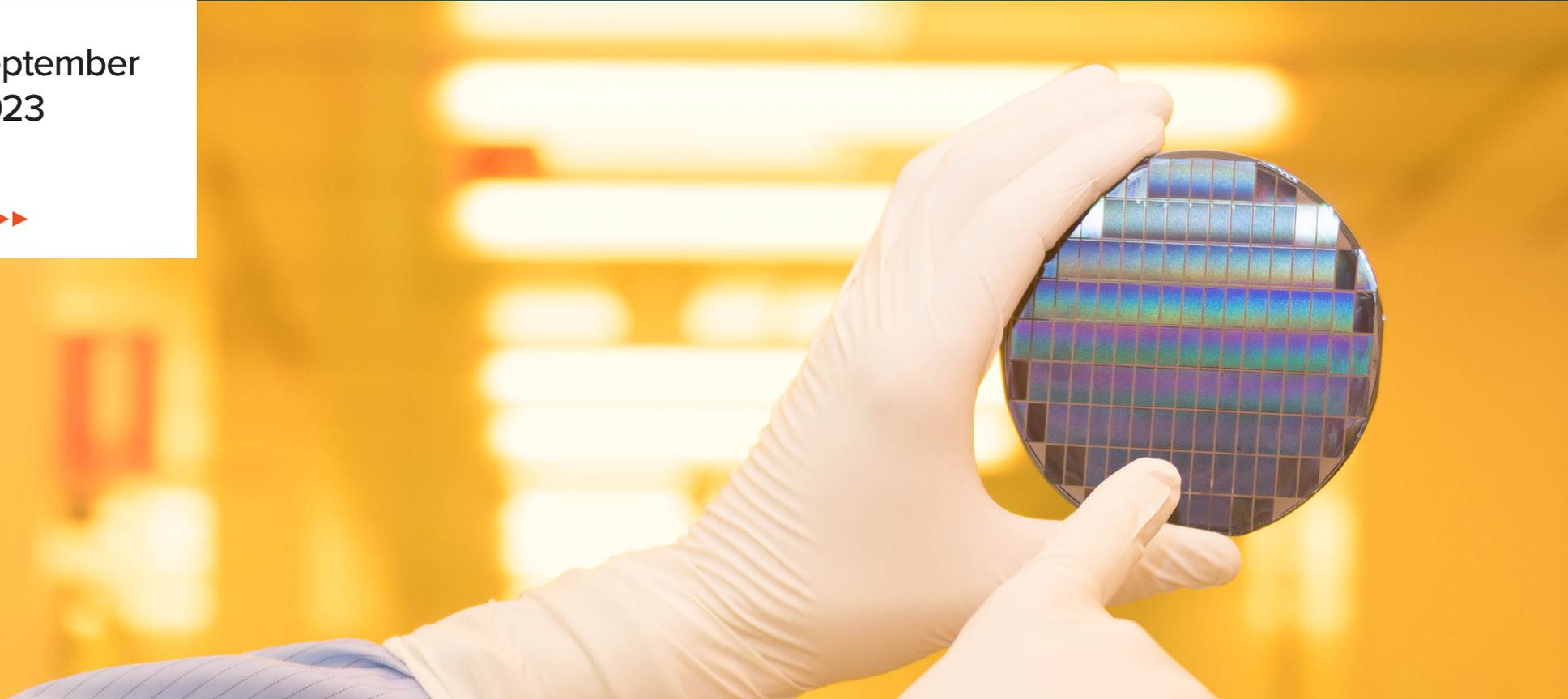


ARCHER

Investor Presentation



September
2023

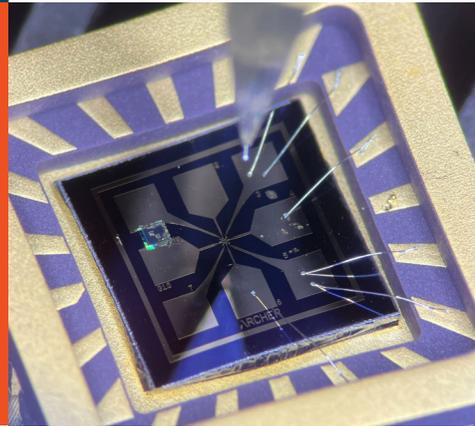




Archer Materials is developing the next generation of advanced semiconductor devices – technologies that are a result of the creativity and pioneering scientific discoveries of our team.

Quantum Technology

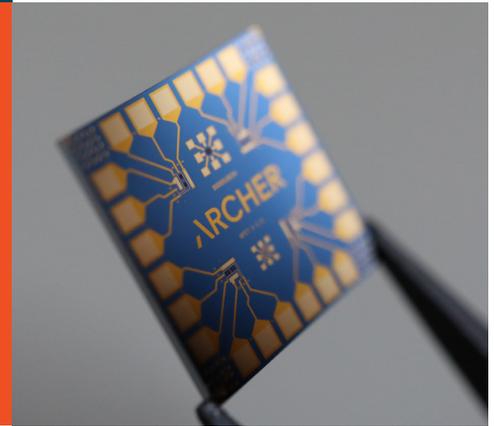
¹²CQ Chip



Qubit processor device with the potential to operate at room-temperature and integrate on-board modern devices.

Bioelectronics

Biochip



Lab-on-a-chip device integrating graphene biosensors with the potential to parallelise the detection of biologically relevant targets.



Archer has the foundations in place to advance its semiconductor development towards commercialisation in global markets.



Access to \$1B+ of deep-tech infrastructure and facilities.



Efficient use of funds with A\$23.3M cash and no corporate debt as of 30 Jun 2023.



Patents granted in the US, China, South Korea, Japan, Hong Kong, Australia, and Europe.



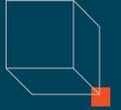
Deep technology development backed by world-class R&D.



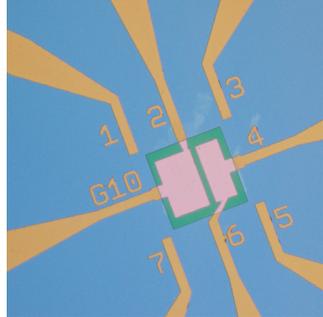
Partnered with tier-one foundries, tech institutes, international organisations and companies.



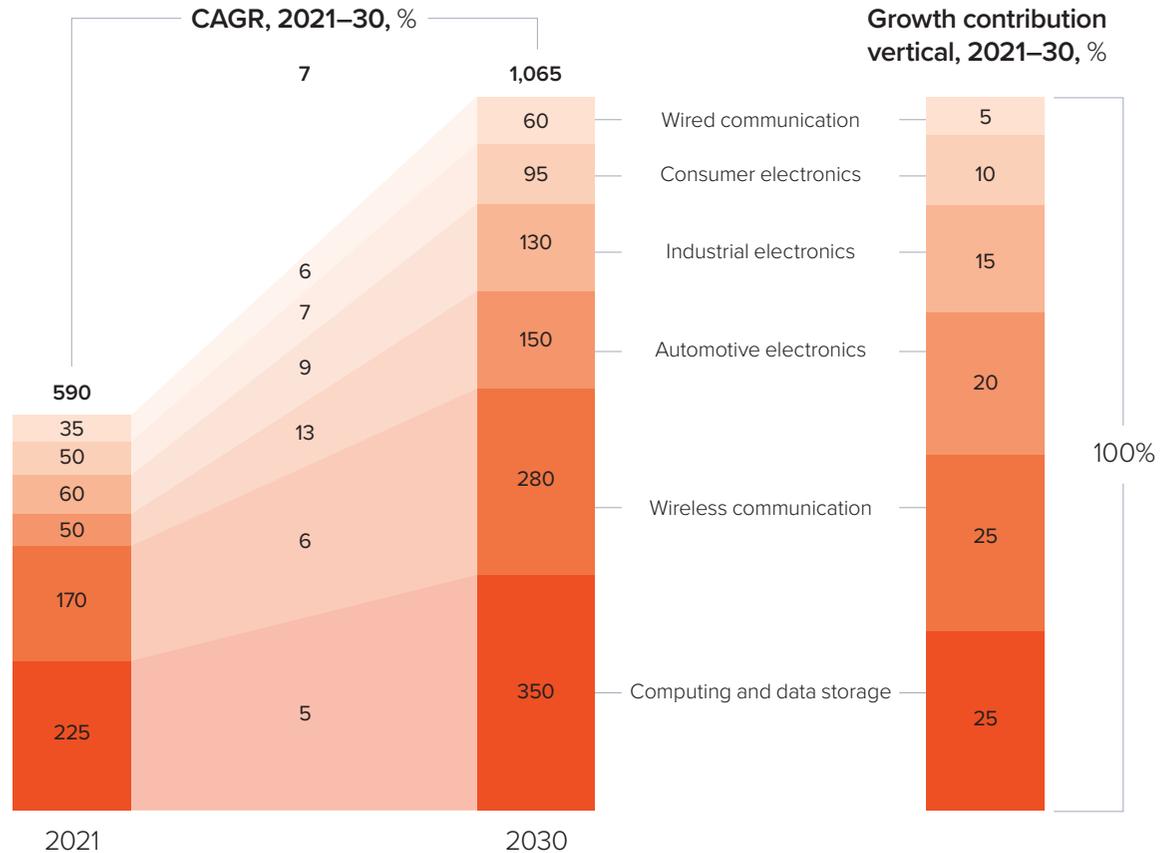
Attracting and retaining pioneering innovators and technologists.



Overall growth in the global semiconductor market is driven by the increased need for processors, sensors, and memory devices in mobility and big data.



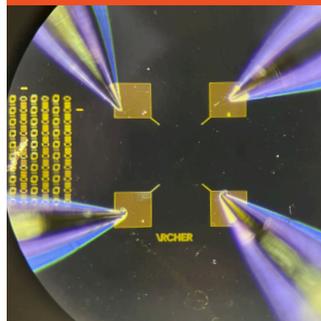
Global semiconductor market value by vertical, indicative, US\$ billion



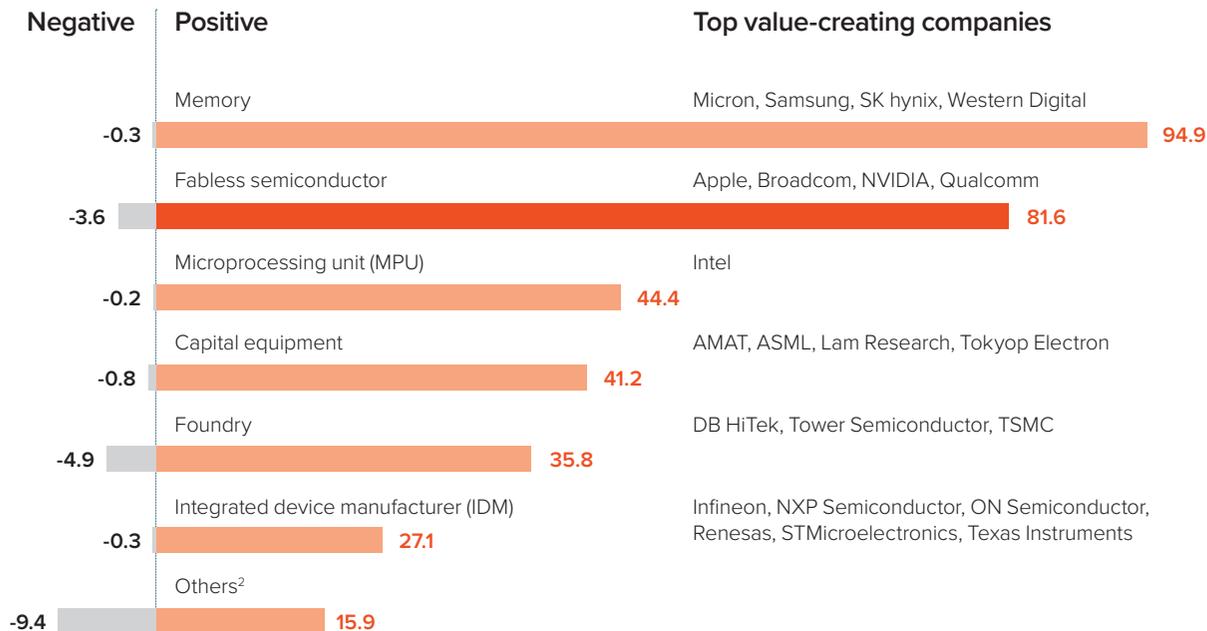
Source: McKinsey & Company analysis.



The semiconductor industry's memory and fabless segments have matured over the past decade to generate the greatest value.



Cumulative economic profit¹ value creation, 2015-19, by segment, US\$ billion

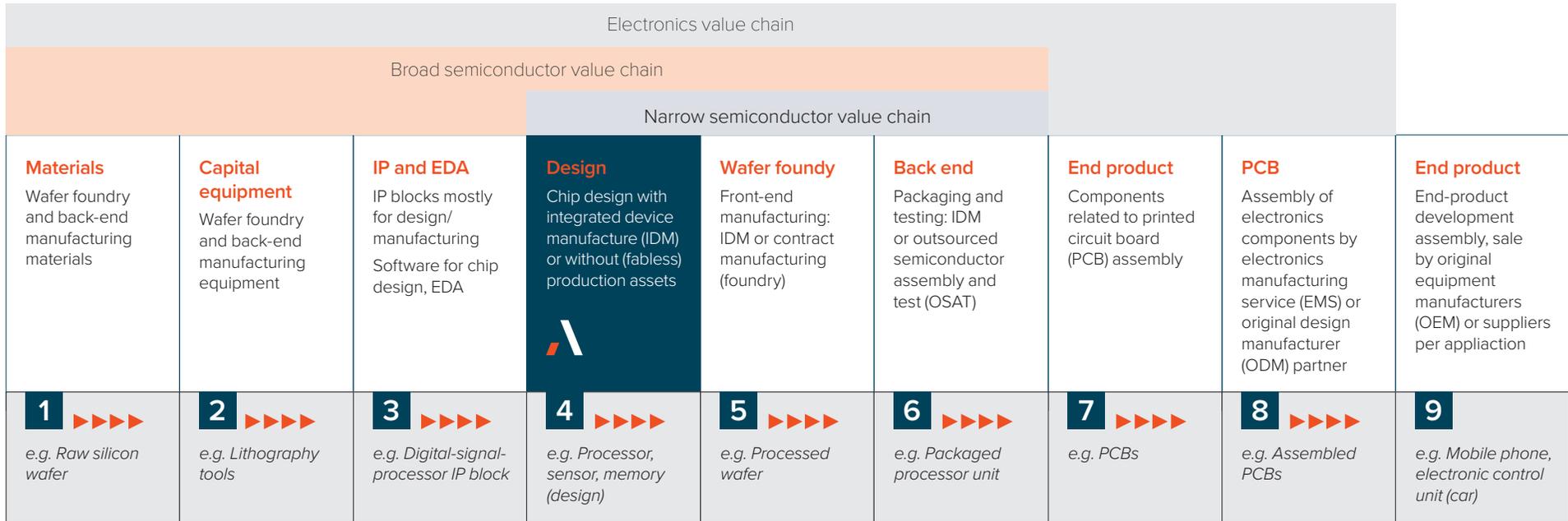


¹ Economic profit is calculated as NOPLAT - (capital charge, where capital charge is invested capital, including goodwill at previous year-end x WACC [weighted average cost of capital]); based on sample of approximately 380 companies.

² Includes EDA, IP, analog IDM, IDM others, and packaging and assembly.



Archer works with foundry partners to deliver its chips using a streamlined fabless commercialisation model.



Source: adapted from McKinsey & Company.



Archer utilises its global partnerships to develop its technologies for potential deployment and use across multiple industries.



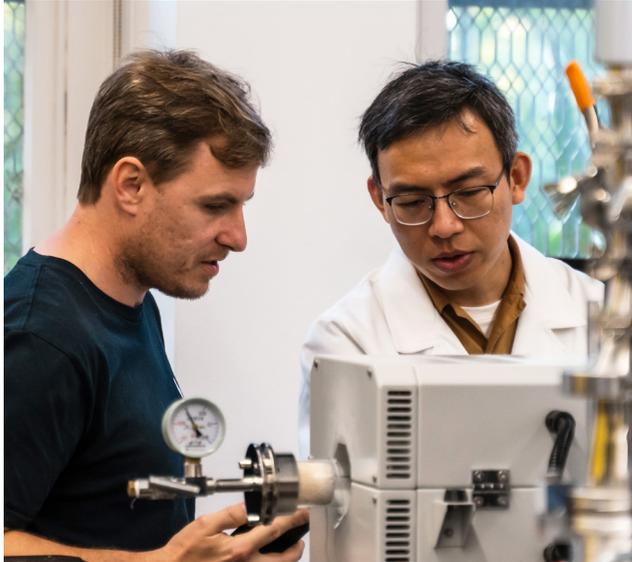
Archer's world-first ¹²CQ chip development involves qubit integration with modern devices made in industrial foundries. HEMT and CMOS integrated circuit technology devices have been used to detect quantum information in the ¹²CQ qubit material at room-temperature.

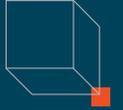
Advanced designs of Archer's biochip graphene field effect transistor sensor technology have undergone scalable semiconductor processing in a commercial foundry. Whole wafer runs have been completed, and MPWs are scheduled with foundry partners in Europe.





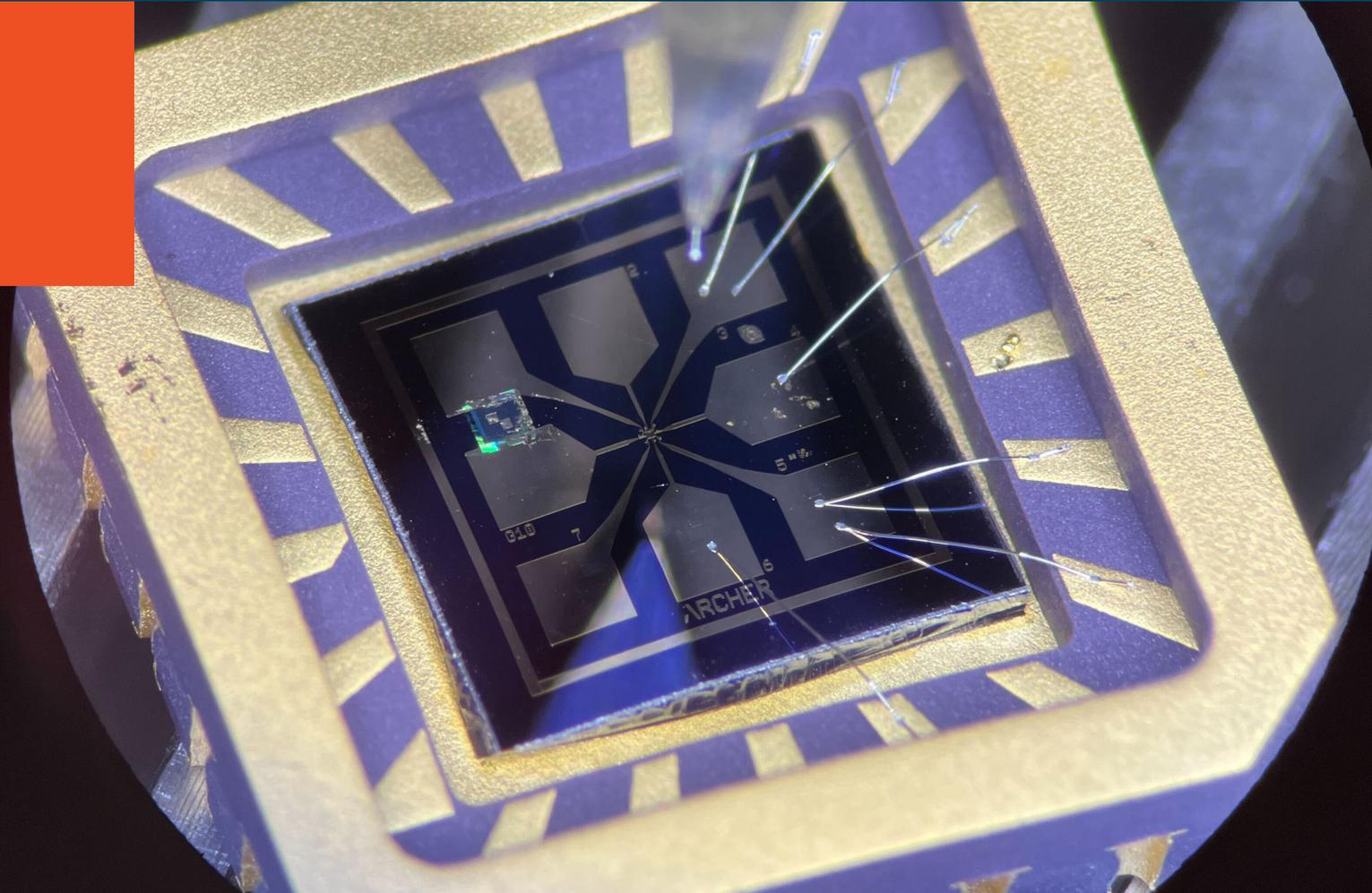
Archer's world-class team enables efficient leading-edge R&D and strengthens IP protection, broadening opportunities for potential commercialisation.





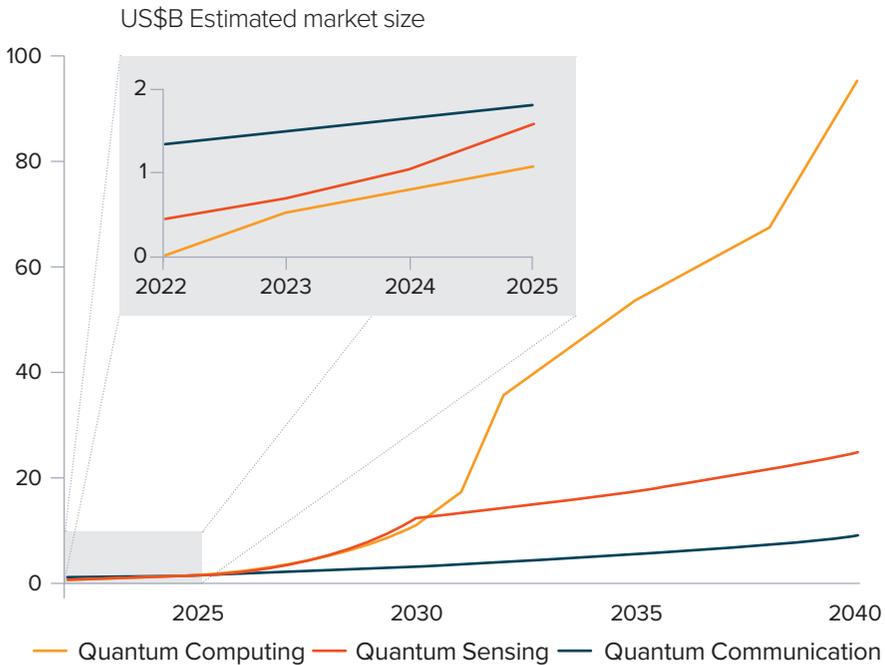
Quantum Technology

^{12}CQ qubit
processor
technology



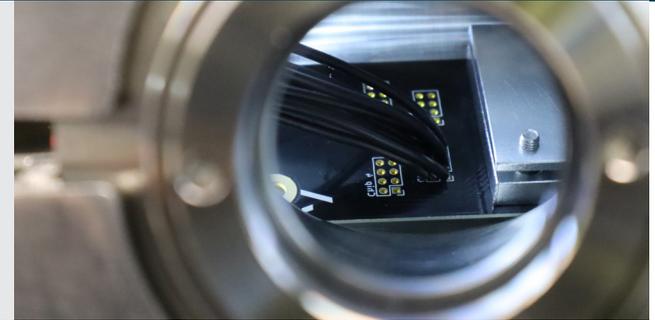


Archer considers quantum technology to be the next great technological advance.

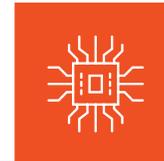


Source: BCG analysis.

Expected large scale adoption after 2030.



Adoption of quantum tech expected to increase with quantum hardware maturity



Quantum computing is expected to rapidly increase in share of total quantum value

Source: Krelina, "Quantum technology for military applications" EPJ Quantum Technology (2021); IBM quantum roadmap; IonQ quantum roadmap





Quantum computing enables hundreds of use cases each with significant value-creation potential.



4 types of computational problems and how quantum computing addresses them.

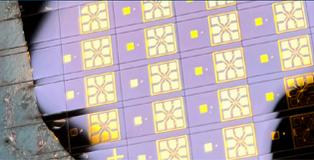
100+ Use cases
Machine learning applications will impact most, if not all, industries.

 <p>Simulation Precisely and efficiently simulate the dynamics of a quantum system.</p>	 <p>Optimisation Efficiently optimise solutions from complex and large data.</p>	 <p>Machine learning Process data sets to reduce noise and simplify computations faster</p>	 <p>Cryptography Improve encryption protecting critical information.</p>
Pharma: drug discovery \$40 billion to \$80 billion	Logistics: network optimisation \$50 billion to \$100 billion	Automotive: autonomous vehicle AI algorithm design Up to \$10 billion	Government: encryption and decryption (related to secure communications and cybersecurity)
Aerospace: computational fluid dynamics \$10 billion to \$20 billion	Insurance: risk management \$10 billion to \$20 billion	Finance: money laundering and fraud prevention \$20 billion to \$30 billion	Corporate: encryption (related to secure communications and cybersecurity) Up to \$10 billion
Chemistry: catalyst design \$20 billion to \$50 billion	Finance: portfolio optimisation \$20 billion to \$50 billion	Tech: generative, foundation and horizontal AI \$50 billion to \$100 billion	
Energy: solar conversion \$10 billion to \$30 billion	Aerospace: route optimisation \$20 billion to \$50 billion		
Finance: market simulation (used in derivatives pricing) \$20 billion to \$35 billion			

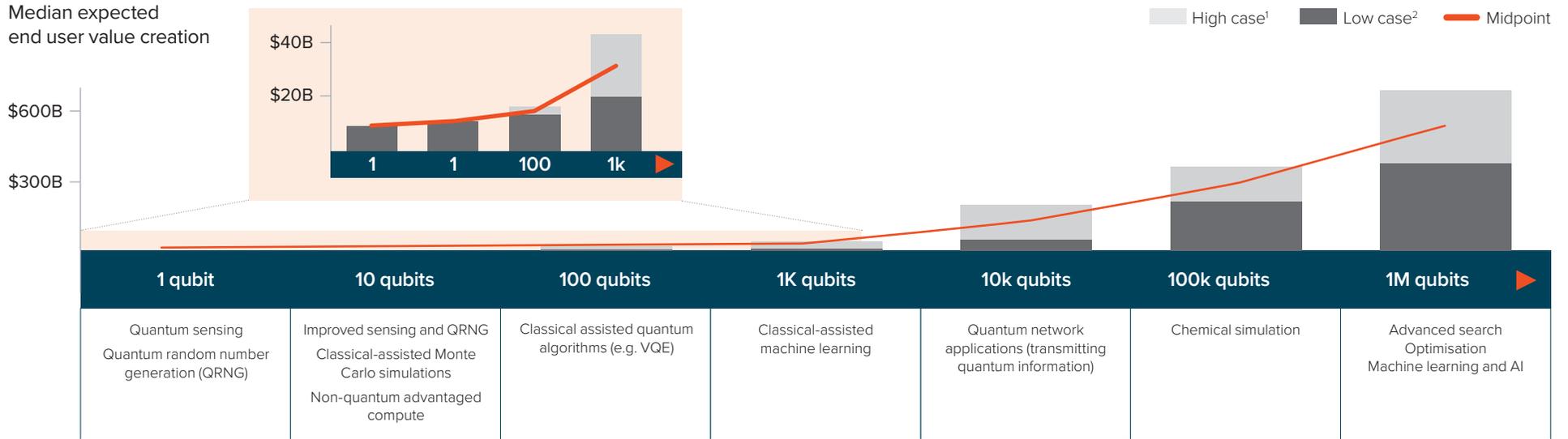
Source: BCG analysis. Note: USD.



The potential of quantum increases with qubit volume, but even one qubit brings incredible value to end users.



End user value creation expected to reach US\$900B at technology maturity.

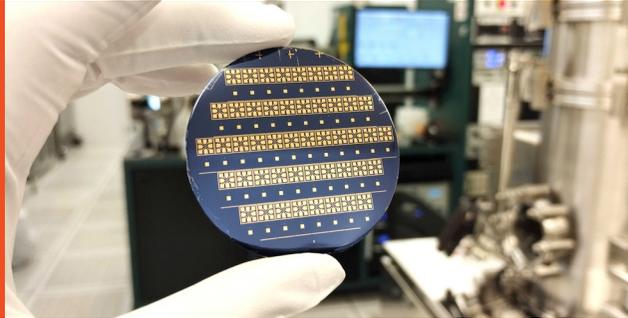


¹ High case based on 100:1 ratio of physical to logical qubits. ² Low case based on 1000:1 ratio of physical to logical qubits. Note: USD.

Source: BCG analysis. Krelina, "Quantum technology for military applications" EPJ Quantum Technology (2021); Perdomo-Ortiz et al, Quantum Sci. Technol. (2018)



Archer is one of few companies globally that is developing a qubit processor. ¹²CQ has unique and promising advantages over other quantum technology.



Room-temperature operation.



Integration with common electronics.



Compatibility with smaller form factors, e.g. mobile phones, laptops, PCs.



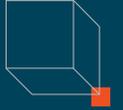
Simplicity in operation and maintenance.



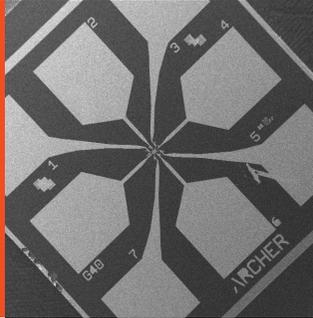
Low-latency, on-premise integration inside data centres.



Highly sensitive mobile use cases with co-located encryption and compute.



The development and integration of Archer's ¹²CQ chip with modern devices has the potential to make quantum technology more accessible.



Datacenter

12 million

Units ordered globally 2021.



Mobile

1.2 billion

Global smartphone shipments in 2022.



Computers

300 million

Global personal computer shipments in 2022.

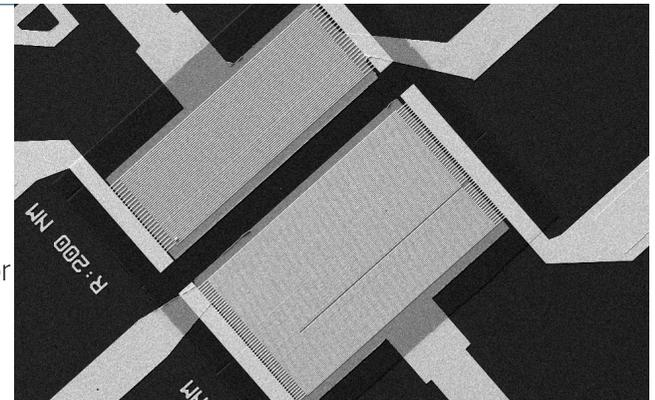


Point-of-Sale

Up to 10 million

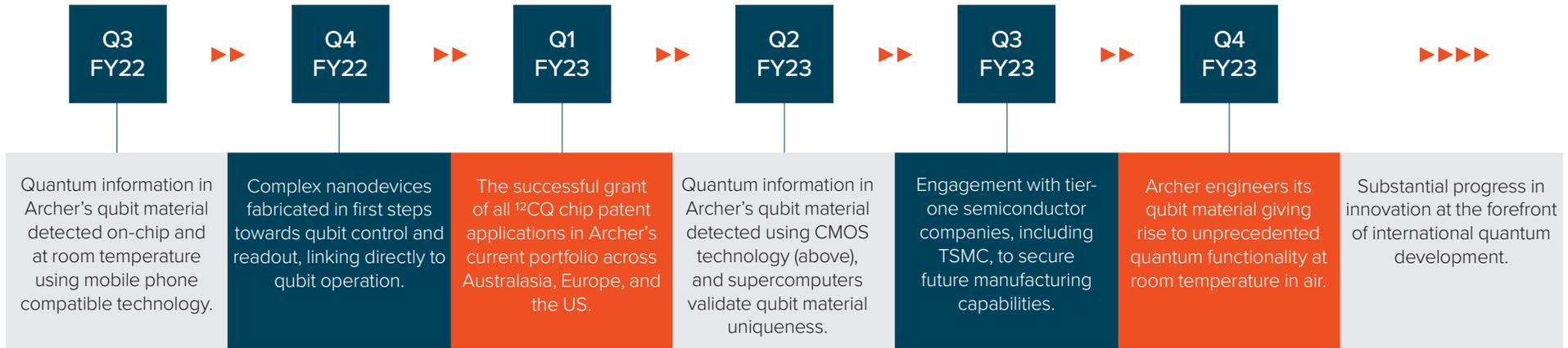
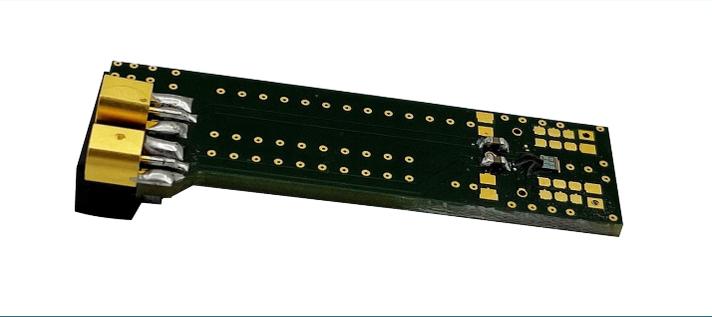
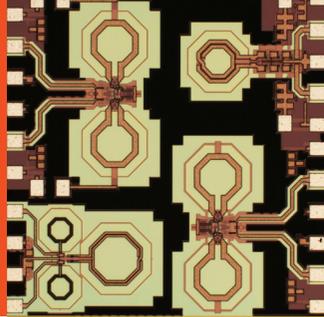
PoS terminals in major economies in 2021.

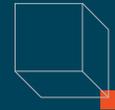
Source: BCG analysis, Statista.





Archer continues to progress towards making quantum processing devices in a much more easily-produced reality in everyday electronics.

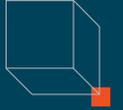




Bioelectronics

Archer
biochip
technology

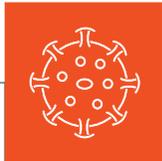




The potential for lab-on-a-chip technology goes beyond simple detection. Miniaturising and integrating a number of medical diagnostic tests into a chip to diagnose, monitor and upload health data could revolutionise healthcare delivery.



Almost half the world's population has a smartphone and two-thirds have some kind of mobile device.



Disruptions to essential health services during the pandemic meant an industry-wide focus on scaling diagnostics.



3.16 billion people cannot reach a healthcare facility by foot within one hour



680 million cannot reach healthcare centers in an hour by car.

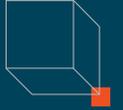


100 million people are pushed into extreme poverty each year due to out-of-pocket health expenses.



Massive shortage of healthcare workers forecast to grow to 18 million by 2030.

Sources: UBS analysis. Willmer, G., (2021, May 18). How the 'expressway' to UHC can help prepare for the next pandemic. Devex. Weiss, D. J., et al. (2020). Global maps of travel time to healthcare facilities. Nature Medicine, 26(12), 1835–1838. World Health Organization: Universal Health Coverage. World Health Organization: Health Workforce.



Value in medtech which includes devices, diagnostics, and digital health therapeutics, is primarily generated through the development of disruptive technology, strong portfolios of intellectual property, and access/ownership of technology infrastructure.

Global health spending increased to (USD)
\$7.9 trillion
 in 2017 and is expected to increase to USD
\$11 trillion
 by 2030.

Sources: UBS, SVB, Pitchbook, J.P. Morgan.

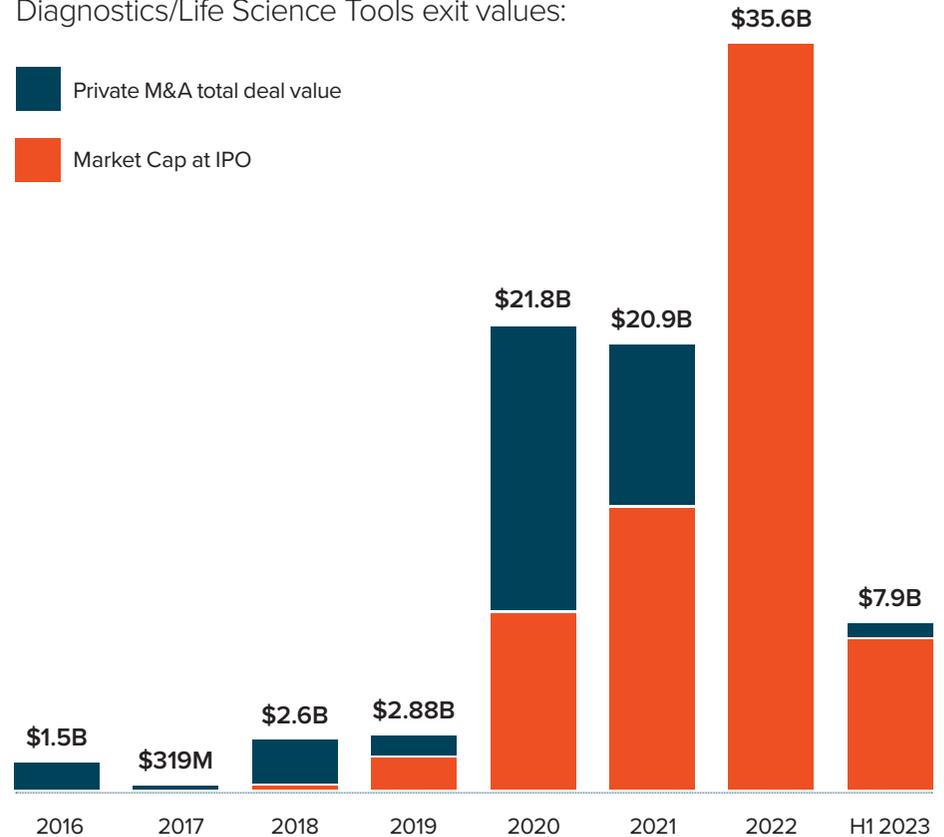


\$100 million
 in total announced upfront cash and equity in licensing deals in the medtech industry for Q2 2023.

\$4.5 billion
 120 medtech deals in Q2 2023 as compared to \$1.1 billion deal values for medtech programs across 120 deals in Q1 2023.

Diagnostics/Life Science Tools exit values:

- Private M&A total deal value
- Market Cap at IPO





Archer is developing a lab on-a-chip biochip platform to provide new-era disease detection in medical diagnostics.



Room-temperature operation to potentially eliminate cold supply-chain logistics.



Sensing pathways developed in-house to detect genetic information.



100% owned IP with patent applications pending in Australia and the US.



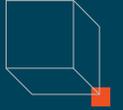
In-house capability spanning biochemistry and chip device nanofabrication.



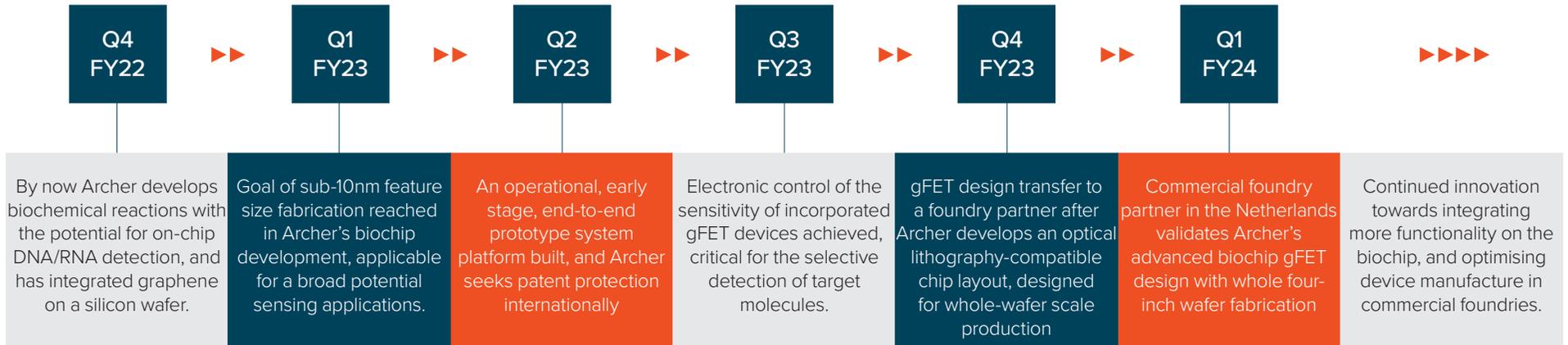
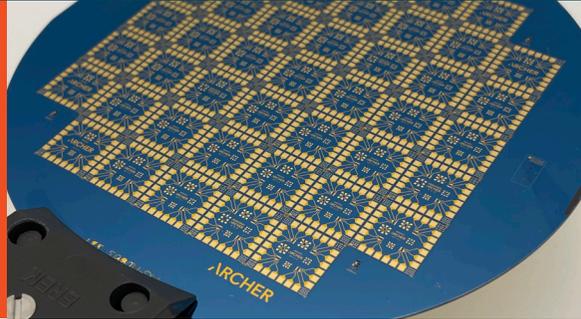
Access to state-of-the-art bio facilities and advanced chip prototyping, testing and development.

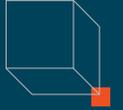


Potential for on-chip detection of pathogens without the need for PCR.



Archer is using graphene transistors as miniaturised and ultrasensitive sensors to detect and analyse disease.





Archer is primed to become a global semiconductor company

The future of tech will look fundamentally different





Archer continues to de-risk its technology and enters FY24 with a strong cash balance to fund continued technological and commercial developments.



In 2023/24, Archer's growth involves:

Technology

Progressing world-first technology development, including ¹²CQ qubit processor chip and graphene-based lab-on-a-chip biochip.

▶▶▶▶

Partnerships

Establishing and strengthening strategic commercial partnerships, including securing future semiconductor manufacturing capabilities advancing technology development.

▶▶▶▶

Innovation

Utilising world-class technology development infrastructure and facilities, R&D, people, and IP, to support pre-market development.

▶▶▶▶

Patents

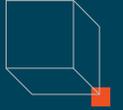
Protecting intellectual property (e.g., patents and international patent applications) with global competitive advantages to underpin innovative technology.

▶▶▶▶

Talent

Hiring new staff to expedite developing and working towards commercialising the Company's technology.

▶▶▶▶



Archer's technology innovation aims to solve long-standing human problems that can't be solved using existing technology.



The future of tech.

Archer's complementary quantum devices offer the potential to overcome significant limitations in traditional digital technologies.

Tier-one supply-chain links.

Archer's partnerships are strong with clear goals. We work with multinationals, startups, and leading R&D labs around the world.

Talented team to rival any.

Archer is developing advanced semiconductor devices based on the breakthrough scientific discoveries of our staff.

Global competitive advantage worth protecting.

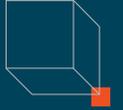
Archer is the only ASX listed company and one of a few players in the semiconductor industry with patents protecting qubit processor technology.

The Company has a growing IP portfolio of granted and pending patents for potentially commercialising step-change advances in its R&D Programs.

Activities with significant impact.

Archer has a solid track record delivering on ambitious goals, with a strong pipeline of 'news flow' expected over the next year.

Archer is part the wider global ecosystem of the semiconductor industry



Disclaimer

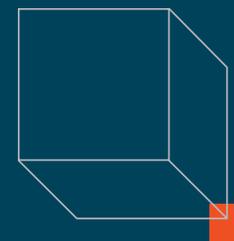


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This presentation contains information which was reported in ASX announcements lodged between 1 October 2017 and 15 September 2023 (together the “Announcements”). All material assumptions and technical parameters set out in the Announcements continue to apply and have not materially changed. The Announcements can be viewed online at <https://www.archerx.com.au>.

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ASX Code: **AXE**

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

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