

PSIQUANTUM

Subject/Issue

The Commonwealth and Queensland Governments will together invest almost \$1 billion for PsiQuantum to build a Fault-Tolerant Quantum Computer (**FTQC**).

Key facts and figures

- On 30 April 2024, the Government announced that the Commonwealth and the Queensland Governments will each invest \$466.4 million, via an equity investment and loans, for PsiQuantum to build a FTQC in Brisbane.
 - PsiQuantum will have to meet conditions and agreed milestones to receive all of the funding, which protects against downside risk.
 - The terms and conditions of the financial package are commercial in confidence; noting that contractual close has not yet occurred.
 - It is not possible at this time to provide a split between the amount of the equity investment and the debt package.
 - PsiQuantum will be responsible for securing additional funding to contribute towards the costs of building and upgrading the FTQC.
 - The Commonwealth expects to make a financial return from the repayment of loans, interest and sharing in equity (shareholder) returns. The expected returns are not for publication (**nfp**) in the 2024-25 Budget, due to commercial sensitivities.
- The Commonwealth's investment in PsiQuantum will be made by Export Finance Australia (**EFA**) on the National Interest Account (**NIA**).
 - The Commonwealth receives all income on NIA transactions and bears all risks and losses.
 - Decisions on the NIA are the responsibility of the Government.
 - After contractual close, EFA will update its transaction register (on its website) providing further information about the investment.
- The Department of Finance's (**Finance**) role in the announced transaction was providing commercial advice to support the Department of Industry, Science and Resources (**DISR**) from June 2023.
 - DISR and the Queensland Government led the negotiations with PsiQuantum. Finance worked with DISR, EFA and expert advisers.
 - DISR is best placed to respond to any detailed questions.

- Finance also provided advice to the Minister for Finance and the Expenditure Review Committee of Cabinet on the proposal.
- The Commonwealth completed extensive due diligence on PsiQuantum, supported by a Technical Advisory Group and expert advisers – including Lazard Australia (commercial/financial), King & Wood Mallesons (legal) and Sententia Consulting (probity).
 - The Commonwealth and Queensland Government also jointly engaged Deloitte (accounting/tax) and Aurecon (infrastructure).
 - The Technical Advisory Group included Australia’s Chief Scientist, Dr Cathy Foley, and representatives from Defence Science and Technology Group, the Commonwealth Scientific and Industrial Research Organisation and the National Measurement Institute.
 - DISR is best placed to respond to procurement related questions.
- DISR undertook a confidential Expression of Interest (**EOI**) process during August and September 2023. The outcomes of the EOI process informed advice provided to the Expenditure Review Committee of Cabinet.
 - DISR has provided evidence previously that the EOI was released to 21 domestic and international quantum computing companies that were identified based on advice from technical experts.
 - The EOI sought to test firms interest and capability in developing, building and operating a commercial-scale quantum computer in Australia, as well as associated benefits to strengthen Australia’s quantum sector and contribute to the national interest.
 - Further questions on the EOI process should be directed to DISR.
- The financial implications are included in the 2024-25 Budget measure *Future Made in Australia – Investing in Innovation, Science and Digital Capabilities*. The financial implications are set out in the table below:
 - EFA-NIA payments and receipts are not for publication (**nfp**) due to commercial sensitivities. Consistent with all NIA transactions, the relevant details will be published by EFA after contractual close – including the split between the equity investment and loans.
 - The measure details \$27.7 million for 11 years from 2023-24 for Departments to finalise the transaction and ongoing oversight, offset from savings identified by DISR. The total offsets being provided by DISR are nfp because they link to EFA NIA payments.
 - Finance will receive \$0.9 million of this funding in 2023-24 for the commercial transaction advice and support provided to DISR.

PsiQuantum

	2023-24 (\$m)	2024-25 (\$m)	2025-26 (\$m)	2026-27 (\$m)	2027-28 (\$m)	Total (\$m)
SPENDING						
Finance - Payments	0.9	-	-	-	-	0.9
DFAT - Payments	0.1	0.3	0.3	0.3	0.3	1.5
DISR - Payments	nfp	nfp	nfp	nfp	nfp	nfp
Treasury - Payments	-	0.7	0.7	0.7	0.7	2.7
EFIC NIA - Payments	nfp	nfp	nfp	nfp	nfp	nfp
Total	nfp	nfp	nfp	nfp	nfp	nfp
SAVINGS / REVENUE ITEMS						
DISR - Offset	nfp	nfp	nfp	nfp	nfp	nfp
EFIC NIA - Receipts	nfp	nfp	nfp	nfp	nfp	nfp
Total	nfp	nfp	nfp	nfp	nfp	nfp
Grand Total	nfp	nfp	nfp	nfp	nfp	nfp

Key points

- The joint Commonwealth-Queensland investment is expected to attract private sector investment, strengthen Australia’s quantum ecosystem and create opportunities for local businesses as part of the supply chain.
 - Quantum computers are considered the next major development in computing, and are expected to help solve intractable problems.
- All Commonwealth investments are reflected as part of the ‘Australian Government general government sector balance sheet’ (Table 10.2 of *Statement 10: Australian Government Budget Financial Statements* in Budget Paper No. 1 (BP1).
 - Loans on the NIA are part of “advances paid” and equity investments are part of “equity accounted investments”.
 - The recognition and derecognition of financial assets does not impact on the underlying cash balance, but does impact on the headline cash balance and gross debt. The **net expected returns** generated from holding financial assets (e.g. interest and dividend receipts less public debt interest) impact on underlying cash.

- As part of the Statement of Risks in BP1, Table 9.3 details expected loans above a materiality threshold as at 30 June 2024 (Page 334-337). Table 9.3 includes ‘Government support for PsiQuantum Pty Ltd’ – where the loan amount, interest rate and term are noted as ‘commercial-in-confidence’.
 - The materiality threshold is generally set at \$200 million.
 - However, table 9.3 also includes several loans with a value less than \$200 million.
 - At this stage, it is not possible to provide a breakdown of the equity investment and loan package provided to PsiQuantum.
 - That breakdown will be disclosed after contractual close.
- This decision builds on the 2023-24 Mid-Year Economic and Fiscal Outlook (MYEFO) measure *National Quantum Strategy – Implementation* (pg 275).
 - Finance received \$0.9 million from this measure for the initial six months of commercial advice and support provided to DISR. At the time of the 2023-24 MYEFO, this funding was classified as ‘nfp’.
 - The additional \$0.9 million Finance received in the 2024-25 Budget was for the next six months to get to contractual close. Finance will not have an ongoing role in oversight of this investment.
- In connection with the investment, PsiQuantum will:
 - establish its Asia-Pacific Headquarters in Brisbane;
 - build and operate successive generations of its FTQC in Brisbane;
 - create up to 400 highly skilled ongoing jobs;
 - establish partnerships with the local quantum industry and advanced manufacturing clusters;
 - create a dedicated climate research centre;
 - open new digital and advanced supply chain opportunities; and
 - invest in university and research collaborations, including PhD positions, mentoring and internship opportunities.
 - Specific questions in relation to expected economic and industry benefits would be best directed to DISR.
- The Minister for Industry and Science, the Hon Ed Husic MP, has claimed Public Interest Immunity in relation to an Order for the Production of Documents related to any correspondence between his Office and the Minister for Defence’s office and/or the Minister for Defence Industry’s office regarding the quantum EOI process, on the basis that:

- the release of the information contained in those documents would, or might reasonably be expected to, disclose the deliberations of Cabinet; and
- the provision of some documents falling within the scope would, or might reasonably be expected to, damage the commercial interests of private organisations in the marketplace on the basis documents contain information that is commercial-in-confidence.

Key information – yet to be released

- Finance began supporting DISR from June 2023 to engage professional advisers to undertake detailed due diligence.
 - From June 2023, an Inter-Departmental Committee (**IDC**) was established that included senior representatives from DISR, Finance, the Department of the Prime Minister and Cabinet, the Department of the Treasury, the Department of Defence (Defence Science and Technology Group (**DSTG**)) and, from January 2024, also the Department of Foreign Affairs and Trade.

Background

The Australian Government's National Quantum Strategy, published in May 2023, outlines how Australia will take advantage of the opportunities presented by quantum technologies.

In the National Quantum Strategy, the Australian Government states under Theme 2 that it will... *"be bold and ambitious in supporting the growth of new quantum infrastructure, including building the worlds' first error-corrected quantum computer in Australia"*.

PsiQuantum is a quantum computing company headquartered in California, United States. The company was founded in 2015 by four individuals, including two Australians, Professor Jeremy O'Brien (Chief Executive Officer) and Professor Terry Rudolph (Chief Architect). The company's mission is to build and deploy the world's first useful quantum computer.

Quantum computing is a transformational and strategically important technology considered to be the next major development in computing. It is capable of delivering tremendous data and processing power to help solve problems classical computers cannot and can drive advances in areas such as new medicines, the net zero transition and artificial intelligence.

There is a global race to build the first Fault-Tolerant Quantum Computer. A number of companies worldwide are pursuing this goal and adopting different scientific approaches.

Supporting information (as at 22 May 2024)

Questions on Notice

*Joint Committee of Public Accounts and Audit “Inquiry into the failed visa privatisation process and the implementation of other public sector IT procurements and projects”:
24 April 2024*

- QoN 1, Mr Aaron Violi MP asked Finance officials if the Finance Department has a role in managing the funding related to the build of a quantum computer. Answer due to be tabled on 24 May 2024.
- QoN 2, Mr Aaron Violi MP asked Finance officials several related questions regarding the 2023-24 MYEFO measure *National Quantum Strategy – Implementation*. Answer due to be tabled on 24 May 2024.
- QoN 3, Mr Julian Hill MP (Chair) asked Finance officials if the ‘quantum computer project’ is a grant or a capital project. Answer due to be tabled on 24 May 2024.

2023-24 Additional Estimates: 15 February 2024 (Industry, Science and Resources Portfolio)

- QoN 132, Senator Andrew Bragg asked **DISR officials** a series of questions related to DISR’s engagement with PsiQuantum. Answer tabled on 13 May 2024.
- QoN 133, Senator Andrew Bragg asked **DISR officials** a series of questions related to quantum computing funding and the EOI. Answer tabled on 13 May 2024.

Freedom of Information (FOI) Requests

- Finance has one outstanding FOI request (23-24\149).

Recent Ministerial Comments

- Tuesday, 30 April 2024 – Press Conference ([Transcript](#)) in Brisbane with the Prime Minister of Australia, Premier of Queensland, Minister for Industry and Science, Deputy Premier of Queensland and Treasurer, and U.S. Ambassador to Australia.
- Tuesday, 30 April 2024 – PM Joint Media Release (at [Attachment A](#))

Relevant Media Reporting (Non-Exhaustive)

- [Labor’s bold \\$1b bet on Aussie quantum start-up](#), Nick Bonyhady, The Australian Financial Review, 29 April 2024.
- [Taxpayers in quantum leap of faith on US computer firm PsiQuantum](#), Joe Kelly and Geoff Chambers, The Australian, 29 April 2024.
- [Australia signs deal worth almost \\$1b with PsiQuantum to build world's first 'useful' quantum computer](#), K. Sato, C. Zonca, L. Ryan, S. Austin, ABC News, 30 April 2024.
- [Two-year charm offensive before Labor ministers did \\$1bn quantum deal](#), Geoff Chambers and Sarah Elks, The Australian, 1 May 2024.
- [So many things wrong with Labor’s one huge bet on PsiQuantum](#), Paul Fletcher, The Australian Financial Review, 5 May 2024.
- [PsiQuantum deal to cost \\$2.5m per year to manage](#), Denham Sadler, Information Age, 16 May 2024.

Delivering a Future Made in Australia with 400 new technology jobs in Brisbane

Media release

Tuesday 30 April 2024

The Hon Anthony Albanese MP | Prime Minister of Australia
The Hon Steven Miles MP | Premier of Queensland
The Hon Ed Husic MP | Minister for Industry and Science
The Hon Cameron Dick MP | Deputy Premier of Queensland and Treasurer | Minister for Trade and Investment

The Albanese and Miles Governments are harnessing the power and potential of quantum technologies to help deliver a Future Made in Australia and make Brisbane a tech manufacturing powerhouse.

The Australian and Queensland Governments will invest almost \$1 billion into frontier technology company PsiQuantum to build the world's first fault tolerant quantum computer in Brisbane.

PsiQuantum's co-founders include Australians Professor Jeremy O'Brien and Professor Terry Rudolph, and the beginnings of its world leading computing approach were developed by Professor O'Brien at the University of Queensland.

This investment marks the start of a manufacturing and production partnership with Queensland and Australia that will create up to 400 new highly skilled ongoing jobs with the company.

Quantum computers are considered the next major development in computing, delivering tremendous data processing power, well beyond the capabilities of today's super-computers.

That processing power can help solve problems conventional computers can't and can help drive advances in areas like new medicines, AI and the net zero transition.

PsiQuantum is a global leader in quantum computing and has attracted significant private investment.

The joint government investment into PsiQuantum will secure its Asia-Pacific headquarters in Brisbane.

This will mean hundreds of direct jobs and billions of dollars of direct investment in Australia by PsiQuantum – investment that would otherwise have gone overseas.

As a result the company will become a cornerstone customer of Australia's digital, quantum and AI supply chains, adding further economic value to the nation.

The joint Commonwealth-Queensland investment includes approximately \$470 million in equity and loans from each government.

As part of this investment, PsiQuantum will:

- Establish its Asia-Pacific Headquarters in Brisbane.
- Build and operate successive generations of its Fault Tolerant Quantum Computer (FTQC) in Brisbane.
- Create up to 400 highly skilled local jobs.
- Establish partnerships with the local quantum industry and advanced manufacturing clusters.
- Create a dedicated climate research centre.
- Open new digital and advanced tech supply chain opportunities.
- Invest in university and research collaborations, including PhD positions, mentoring and internship opportunities.

This investment aligns with the Government's commitments under the [National Quantum Strategy](#).

Quotes attributable to Prime Minister Anthony Albanese:

"It takes great partnerships to build new industries. We need to make bold investments today if we want to see a Future Made in Australia.

"We are proud to be working with the Queensland Government to make visionary investments in the future of our nation.

"This investment shows we are serious about building a strong quantum ecosystem here in Australia."

Quotes attributable to Queensland Premier Steven Miles:

"Today's announcement cements Queensland's position as a global leader in the quantum technology industry, backed by our dedicated Quantum and Advanced Technologies Strategy.

"Quantum will bring billions in economic opportunity to Queensland, which will deliver thousands of high paying tech jobs and the chance for Queenslanders to work in careers that will change the world.

"This investment partnership is as significant for Queensland and the nation as the first silicon microprocessors were to California that established Silicon Valley.

"Queensland and Australia will now be at the epicentre of this world changing technology."

Quotes attributable to Minister for Industry and Science, Ed Husic:

"Quantum tech will drive the growth of advanced manufacturing and the Albanese Government sees this investment in PsiQuantum as a big part of that effort.

"We want to build the quantum tech sector with local talent and we want to bring talented Aussies home to meet our national ambition to make Australia a centre for quantum growth.

"Australia built one of the world's first digital computers, only to give up our chance to design and develop computing here.

"John Howard's Government turned its back on the chance to manufacture computer chips in Australia.

"Australia has hugely talented people with great ideas that want to build strong companies and secure jobs. That's going to help us deliver a Future Made in Australia."

Quotes attributable to Queensland Deputy Premier and Treasurer, Cameron Dick

"The Queensland Government is delivering on our plan to create more jobs in more industry by diversifying our state's economy.

"This deal is the result of years of hard work and planning by Queensland Treasury officials, and I congratulate them on this achievement.

"There will be very few seats at the table when it comes to global leadership in quantum technology, and today's announcement ensures Queensland will have a place."

Quotes attributable to Australia's Chief Scientist, Dr Cathy Foley:

"Quantum computing is a transformational and strategically important technology. It will disrupt all sectors of society. Australia is perfectly placed to achieve a globally significant quantum industry, but we can't take a business-as-usual approach to realising this potential.

"We must take advantage of the quantum technology wave to reach the industry scale needed by attracting quantum companies to set up manufacturing here. This investment shows that Australia is serious about its quantum industry development by ensuring we are at the front of the pack in the global race to build the first useful quantum computer."

INVESTMENT IN PSIQUANTUM

Headline Statement

- On 30 April 2024, the Australian and Queensland Governments announced they would invest almost \$1 billion into frontier technology company PsiQuantum to build its world first fault tolerant quantum computer in Brisbane.

Key Points

Details of the transaction

- The Commonwealth will provide \$466.4 million through a mix of debt and equity.
 - This structure is designed to secure the Government a long-term return on its investment, via repayment of loans and participation in equity (shareholder returns).
- PsiQuantum is required to meet milestones and deliverables as part of the package.
 - Funding obligations are managed against agreed technology and infrastructure milestones.
 - Conditions and milestones have been informed by technical, legal and commercial due diligence by experts. These are contractually binding. Details are commercial in confidence.
 - Security arrangements will also reduce the commercial exposure and secure performance under the contract.
- PsiQuantum is expected to raise additional funding from existing and new investors as part of its contributions toward the project.
- Commonwealth financing is being provided through Export Finance Australia.
 - EFA will disclose details in accordance with its normal reporting requirements and in a manner that respects the commercial confidentiality of the company.
- The terms and conditions of the financial package are commercial in confidence.

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Last updated: 17/07/2024 2:10:00 PM

Ecosystem benefits

- The Government is committed to ensuring Australia's quantum sector remains a global leader, as outlined in the National Quantum Strategy.
 - The strategy presents the Government's vision to unlock the potential of quantum technologies, including an ambition to build the world's first error-corrected quantum computer in Australia.
- PsiQuantum's Australian operations will include:
 - Establishing its Asia-Pacific headquarters in Brisbane, along with facilities to build and operate the quantum computer. The company has said publicly that it is on an aggressive plan to have the site operational by the end of 2027.
 - Delivering successive generations of a commercial scale quantum computer and maintaining the product site as a flagship global facility over an expected 20-year life.
- The investment in PsiQuantum shows the Government is serious about delivering a world-leading quantum ecosystem. It is designed to crowd in talent, create opportunities for advanced manufacturing and supply chains, and seed more investment.
- PsiQuantum will deliver on a number of commitments over the life of the agreement. These include:
 - Proactively building opportunities for partnerships with local industry and government, including to support the creation of advanced manufacturing clusters and participate in the development of an innovation precinct adjacent to the quantum computing site
 - Collaborating with universities and research institutions on R&D
 - Funding PhD positions and operating dedicated internship and mentorship programs
 - Creating hundreds of direct, local, high-skilled jobs
 - Leveraging its existing relationships with global leaders in technology to bring additional expertise and experience to the Australian quantum ecosystem
 - Establishing a dedicated climate-related research centre in Brisbane.
- PsiQuantum has committed to providing Australian researchers and companies with access to the capability (in line with PsiQuantum's commercial strategy).
 - The Government will continue to work closely with industry to build 'quantum readiness' so that industry can grasp the opportunities this capability will bring.

Process

- PsiQuantum’s initial engagement with the Commonwealth Government was via Austrade, commencing in 2019.
 - Austrade’s role is to attract direct foreign investment.
 - Austrade provided information on market opportunity in Australia and relevant government programs, and introduced the company to state and territory governments.
 - The company provided a proposal to government in late 2022.
- There were multiple phases of due diligence, increasing in intensity, with Government decision-points / gateways throughout.
 - Deloitte was engaged in February 2023 to lead an initial phase of commercial, technical and economic due diligence on PsiQuantum’s proposal.
 - The department subsequently engaged commercial, legal, economic and external probity advisers to support this work (Lazard Australia, King & Wood Mallesons, Sententia Consulting).
 - The Commonwealth and Queensland governments jointly engaged Boston Consulting Group (economic analysis of the quantum computing opportunity in Australia), Deloitte (financial) and Aurecon (independent infrastructure experts).
- There was appropriate governance with a Commonwealth Band 3 interdepartmental committee.
- Australia’s Chief Scientist, a quantum physics and semiconductors expert, is a public champion of Australia’s quantum opportunity:
 - “...it’s important to remember that this won’t be Australia’s only quantum computer. As the developments already underway in Australia demonstrate, the future of quantum computing is likely to be as diverse as classical computing is today...” [AFR Op Ed, 7/5/24]
 - “To reach critical mass and achieve a globally competitive industry, we need to crowd in quantum companies, big and small.” [AFR Op Ed, 7/5/24]
 - “We must take advantage of the quantum technology wave to reach the industry scale needed by attracting quantum companies to set up manufacturing here. This investment shows Australia is serious about its quantum industry development by ensuring we are at the front of the pack in the global race to build the first useful quantum computer.” [PM/Minister media release, 30/4/24]
- As the Prime Minister has said:
 - “This wasn’t a decision taken lightly. This was examined in all its aspects.... All of the aspects went through an enormous amount of work and many hours of many meetings, at every level of our cabinet processes, to make sure it was the right thing to do.”

- “And the government’s absolutely convinced that it was, as were all of Treasury and Industry and other agencies as well.”
- “... there is in this case, an example of a first mover advantage as well. If we get ahead of the pack this is an extraordinary breakthrough.” [*Capital Brief, 13/5/24*]
- In Minister Husic’s words:
 - “...we’re bringing PsiQuantum home...to build the world’s first fault-tolerant quantum computer in Brisbane, and it will give our industries and our economy the power needed to stay ahead of the pack. Quantum computing is vital to both our economic and our national security.” [*Question Time Hansard, 16/5/24*]
 - “We are investing in multiple quantum computing technologies, having provided continued backing for (former Australian of the Year Michelle Simmons’ company) Silicon Quantum Computing...” [*The Australian, 20/5/24*]
 - “We are covering all bases to ensure Australia can develop onshore its own fault tolerant quantum computer.” [*The Australian, 20/5/24*]
 - “We have gone through a rigorous process of market testing, and then subjecting that to technical analysis, backing it in with legal and commercial advice to structure a deal...and also with commitments to the local economy. It’s not just investing in them and saying that’s that, they’ve got to work with the local community and economy as well.” [*Interview, Sky News, 17/5/24*]
- Extensive technical diligence was undertaken by Commonwealth experts.
 - Technical assessments were supported by oversight from a Technical Advisory Group, which included senior representatives with relevant expertise from DSTG and CSIRO, as well as Australia’s Chief Scientist.
 - Queensland engaged its own expertise.
- An EOI process was run from August to September 2023 to test the market to ensure an effective, efficient, economical and ethical use of Commonwealth funds consistent with the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and the Commonwealth Investment Framework.
 - The EOI was released in August 2023 to 21 companies identified based on market research and advice from technical experts, with review by the Technical Advisory Group.
 - The EOI tested interest and capability in developing, building and operating a commercial-scale universal fault tolerant quantum computer in Australia, as well as associated benefits to strengthen Australia’s quantum sector and contribute to the national interest.
 - The Department of Finance is responsible for the Commonwealth Investment Framework and the department has worked closely with Finance on this transaction.
 - Details of who responded to the EOI are confidential.

- The Government will provide \$466.4 million over 11 years from 2023-24 for a financing package of equity and loans for PsiQuantum to construct and operate its quantum computing capabilities and associated investment in industry research and development in Brisbane.
- Additional funding of \$27.7 million will be provided over 11 years from 2023-24 for the Department of Finance, the Department of Foreign Affairs and Trade, the Department of Industry, Science and Resources and the Department of the Treasury to manage and provide oversight of the investment.
 - This includes funding of \$16.1 million over 11 years from 2023-24 for the Department of Industry, Science and Resources to manage and provide oversight of the investment.
- The financial implications are included in the 2024-25 Budget measure *Future Made in Australia: Investing in Innovation, Science and Digital Capabilities*. The impact over the Forward estimates is set out in the table below:

	2023-24 (\$m)	2024-25 (\$m)	2025-26 (\$m)	2026-27 (\$m)	2027-28 (\$m)		Total (\$m)
Export Finance and Insurance Corporation – National Interest Component	nfp	nfp	nfp	nfp	nfp		nfp
Department of Industry, Science and Resources	nfp	nfp	nfp	nfp	nfp		nfp
Department of Finance	0.9	-	-	-	-		0.9
Department of Foreign Affairs and Trade	0.1	0.3	0.3	0.3	0.3		1.5
Department of the Treasury	-	0.7	0.7	0.7	0.7		2.7
Total	1.0	1.0	1.0	1.0	1.0		5.1