



## Policy costing

### Put Australia on a path to achieve 4 per cent of gross domestic product (GDP) in science, research and innovation spending

Party:

Australian Greens

#### Summary of proposal:

The proposal has four components to increase expenditure to support Australian science, research and innovation.

- Component 1 – Establish an additional non-refundable tax offset of 20 per cent for companies that hire science, technology, engineering and mathematics (STEM) PhD students or equivalent graduates in their first three years of employment.
- Component 2 – Restore the Sustainable Research Excellence grants program, which ceased in December 2016.
- Component 3 – Twelve capped programs, with funding for each program to be ongoing and indexed in line with growth in the consumer price index (CPI). Where relevant, departmental expenses have been calculated based on programs of a similar size.
  - a \$88.9 million each year to the Australian Research Council.
  - b \$83.3 million each year to the National Health and Medical Research Council.
  - c \$33.3 million to Cooperative Research Centres.
  - d \$50 million each year to research and innovation organisations to support women in science.
  - e \$175 million each year to increase funding to the Research Infrastructure Investment Strategy.
  - f \$15 million each year to support international collaboration via the existing global innovation strategy.
  - g \$70 million each year to the Future Fellowship Scheme.
  - h \$46.2 million each year to drive the development and implementation of a national open access publishing program.
  - i \$47 million each year to support the phasing-in of funding reforms that support the indirect funding of health and medical research.
  - j \$40 million each year to fund four new integrated health research centres.
  - k \$41.7 million each year to existing teacher training in STEM education.
  - l \$50 million each year for a Secure Work for Researchers fund, to assist universities and research institutes to transition their workers to ongoing employment.

- Component 4 – Reverse two Government measures.
  - a The 2014-15 Budget measure *Science and Research Agencies – reduced funding*. The total savings from this measure are to be returned to the Commonwealth Science and Industry Research Organisation (CSIRO), the Australian Nuclear Science Technology Organisation (ANSTO) and the Australian Institute of Marine Science (AIMS) divided evenly over three years from 2019-20.
  - b The 2018-19 unlegislated Budget measure *Better targeting of the Research and Development Tax Incentive*.

The proposal would commence from 1 July 2019.

## Costing overview

The proposal would be expected to decrease the fiscal balance by \$6,107.4 million and the underlying cash balance by \$5,627.4 million over the 2019-20 Budget forward estimates period. On a fiscal balance basis, this impact reflects a decrease in revenue of \$470.0 million and an increase in expenses of \$5,637.4 million.

The proposal would be expected to have an impact beyond the 2019-20 Budget forward estimates period. A breakdown of the financial implications over the period to 2029-30 is provided at [Attachment A](#).

There is a difference between the fiscal and underlying cash balance impact of this proposal because the expenditure on refundable tax offsets is recognised on an accrual basis before payments are made.

The estimates of Component 1 are sensitive to a number of assumptions about the current expenditure on the employment of STEM PhD or equivalent graduates, the size of the PhD graduate cohort, the proportion that are employed in private sector research and development (R&D), and their average salaries.

The estimates of Component 2 are sensitive to the estimated value of grants awarded under the restored Sustainable Research Excellence grants program.

The estimates of Component 3 are sensitive to changes in projections of the CPI. The Parliamentary Budget Office (PBO) has not undertaken any analysis to assess whether the proposed expenditure would be sufficient to achieve the objectives of the policies under this component.

Departmental expenses have been included for the Department of Industry, Innovation and Science to administer programs under Component 3.

The estimates of Component 4a are not subject to uncertainty as they are fixed funding amounts.

The estimates of Component 4b are particularly sensitive to the assumptions concerning the growth in eligible expenditure on R&D activities. Changes to these assumptions could significantly affect the estimated impact of reversing this measure.

**Table 1: Financial implications (\$m)<sup>(a)(b)</sup>**

	2019–20	2020–21	2021–22	2022–23	Total to 2022–23
Fiscal balance	-1,210.1	-1,567.4	-1,654.8	-1,655.3	<b>-6,107.4</b>
Underlying cash balance	-1,010.1	-1,417.4	-1,534.8	-1,645.3	<b>-5,627.4</b>

(a) A positive number represents an increase in the relevant budget balance; a negative number represents a decrease.

(b) Figures may not sum to totals due to rounding.

## Key assumptions

The PBO has made the following assumptions in costing this proposal.

### Component 1: STEM PhD tax incentive

- 43 per cent of STEM PhD or equivalent graduates are employed in the private sector.
  - Half of STEM PhD or equivalent graduates who are employed in the private sector are working in R&D activities.
  - Approximately 80 per cent of these graduates would be full-time-equivalent employees.
- Eligible graduates would have an average salary of \$83,000 in 2019-20 and their salaries would grow in line with average weekly earnings projections.
- Eligible expenditure on STEM PhD or equivalent graduates would increase over the first three years of the proposal. This would be because in each of the first three years a new PhD cohort would finish their studies and their employment costs would become eligible for the collaboration premium rate.

### Component 2: Reinstating the Sustainable Research Excellence grants program

- The total grant payment that would be awarded under the Sustainable Research Excellence grants program in 2017 (if it had not ceased) would be proportional to the relative funding amounts under the Sustainable Research Excellence grants program in 2016 and the Research Support Program in 2017.

### Component 4: Reversing measures

- For Component 4b:
  - eligible expenditure on R&D activities by companies with a turnover greater than \$20 million would remain constant over time
  - eligible expenditure on R&D activities by companies with a turnover less than \$20 million would grow by approximately 6 per cent per year, in line with historical growth.

## Methodology

### Component 1: STEM PhD tax incentive

The eligible expenditure on STEM PhD or equivalent graduates in their first three years of employment was based on an estimate of the number of students who graduate from Australian universities with STEM PhDs each year, the proportion of STEM PhD recipients who are employed in the private sector, the assumed proportion who would be working in R&D, the assumed proportion who would be working on a full-time-equivalent basis, and their assumed earnings.

The total amount of additional R&D tax offset available was calculated by applying the specified premium percentage to the total eligible expenditure on R&D activities. These figures were adjusted to account for the timing of company tax payments.

### Component 2: Reinstating the Sustainable Research Excellence grants program

The financial impact of restoring the Sustainable Research Excellence grants program was estimated using payment data on the Sustainable Research Excellence grants program and the Research Support Program. A ratio of payments under the Sustainable Research Excellence grants program in 2016 and the Research Support Program in 2017 was derived, after accounting for indexation.

This ratio was applied to Research Support Program payments in 2017 and 2018 to estimate Sustainable Research Excellence grants program payments for these years. These calendar year estimates were averaged to derive an estimate for the financial year 2017-18 and then indexed by CPI over the period to 2029-30, noting that this proposal commences on 1 July 2019.

### Component 3: Capped funding

The financial impact of the proposed funding for each program under Component 3 was derived by applying relevant indexation arrangements to the specified amounts.

Departmental costs for this component have been estimated based on similar-sized programs and the Department of Finance's costing parameters, and have been deducted from the specified total funding envelope.

### Component 4: Reversing measures

The financial impact of reversing the 2018-19 unlegislated Budget measure *Better targeting of the Research and Development Tax Incentive* was calculated using a microsimulation model of company tax as at the 2019-20 Budget, developed by the PBO. This model estimated the company tax liabilities for all companies over the period to 2029-30 under current and proposed settings, based on company tax data for the 2016-17 financial year (including benchmarking to aggregate company tax revenue estimates) and taking into account the effect of the imputation system.

The eligible expenditure on R&D activities for each company was derived from their current year offset amount for the 2016-17 income year and then grown across the medium term. This expenditure amount was then used to recalculate their offset amounts under the current measure and under the proposal. These offset amounts were then used to calculate the company tax revenue and refundable tax offset expenses for each company under the current measure, including the effects of the dividend imputation system and any offsets carried forward from previous years.

The financial impact of reversing the 2014-15 Budget measure *Science and Research Agencies – reduced funding* was calculated as specified in the proposal.

Revenue and administered expense estimates for Component 1, Component 2 and Component 4 have been rounded to the nearest \$10 million.

Administered expense estimates for Component 3 and all departmental expense estimates have been rounded to the nearest \$100,000.

## Data sources

The Australian Taxation Office provided the de-identified company tax return data for the 2016-17 financial year.

Commonwealth of Australia, 2018. *Budget 2018-19*, Canberra: Commonwealth of Australia.

Commonwealth of Australia, 2019. *Budget 2019-20*, Canberra: Commonwealth of Australia.

The Department of Industry, Innovation and Science provided costing and staffing data for the *Science and Research Agencies – reduced funding* measure from the 2014-15 Budget.

Department of Education and Training, 2018. *RBG Allocations Time Series [Online]*. Available at <https://docs.education.gov.au/node/47846> [accessed 11 July 2018].

Department of Education and Training, 2015. *International Students Studying Science, Technology, Engineering and Mathematics (STEM) in Australian Higher Education Institutions*, Canberra: Commonwealth of Australia.

Graduate Careers Australia, 2015. *Postgraduate Destinations 2015: A report on the work and study outcomes of recent higher education postgraduates*, Melbourne: Graduate Careers Australia.

Office of the Chief Scientist, 2016. *Australia's STEM Workforce: Science, Technology, Engineering and Mathematics*, Canberra: Commonwealth of Australia.

# Attachment A – Put Australia on a path to achieve 4 per cent of gross domestic product (GDP) in science, research and innovation spending – financial implications

**Table A1: Put Australia on a path to achieve 4 per cent of gross domestic product (GDP) in science, research and innovations spending – Fiscal balance (\$m)<sup>(a)(b)</sup>**

	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	2029–30	Total to 2022–23	Total to 2029–30
<b>Revenue</b>													
<i>Company tax revenue – Component 1</i>	-	-10.0	-10.0	-20.0	-30.0	-30.0	-30.0	-30.0	-40.0	-40.0	-40.0	-50.0	-280.0
<i>Company tax revenue – Component 4b</i>	-	-170.0	-120.0	-120.0	-130.0	-140.0	-150.0	-160.0	-170.0	-180.0	-190.0	-420.0	-1,560.0
<b>Total – revenue</b>	-	<b>-180.0</b>	<b>-130.0</b>	<b>-140.0</b>	<b>-160.0</b>	<b>-170.0</b>	<b>-180.0</b>	<b>-190.0</b>	<b>-210.0</b>	<b>-220.0</b>	<b>-230.0</b>	<b>-470.0</b>	<b>-1,840.0</b>
<b>Expenses</b>													
<i>Administered</i>													
<i>Reinstating sustainable research excellence – Component 2</i>	-220.0	-230.0	-230.0	-240.0	-250.0	-250.0	-260.0	-260.0	-270.0	-280.0	-280.0	-920.0	-2,770.0
<i>Component 3a</i>	-88.9	-91.0	-93.1	-95.4	-97.8	-100.2	-102.7	-105.3	-107.9	-110.6	-113.4	-368.3	-1,106.3
<i>Component 3b</i>	-83.3	-85.2	-87.2	-89.4	-91.6	-93.9	-96.3	-98.7	-101.1	-103.7	-106.2	-345.1	-1,036.6
<i>Component 3c</i>	-33.3	-34.1	-34.9	-35.7	-36.6	-37.5	-38.5	-39.4	-40.4	-41.4	-42.5	-138.0	-414.4
<i>Component 3d</i>	-48.4	-49.6	-50.7	-52.0	-53.3	-54.7	-56.0	-57.4	-58.7	-60.1	-61.6	-200.7	-602.6
<i>Component 3e</i>	-175.0	-179.1	-183.2	-187.8	-192.5	-197.3	-202.2	-207.3	-212.5	-217.8	-223.2	-725.0	-2,177.7
<i>Component 3f</i>	-14.5	-14.9	-15.2	-15.6	-16.0	-16.4	-16.8	-17.2	-17.6	-18.0	-18.5	-60.2	-180.7
<i>Component 3g</i>	-68.3	-69.9	-71.5	-73.3	-75.2	-77.0	-78.9	-80.9	-82.8	-84.8	-86.8	-283.0	-849.5
<i>Component 3h</i>	-44.6	-45.7	-46.8	-48.0	-49.2	-50.4	-51.6	-52.9	-54.2	-55.5	-56.7	-185.1	-555.6
<i>Component 3i</i>	-45.4	-46.5	-47.6	-48.8	-50.1	-51.3	-52.6	-53.8	-55.1	-56.4	-57.8	-188.4	-565.5
<i>Component 3j</i>	-39.3	-40.2	-41.2	-42.3	-43.3	-44.4	-45.5	-46.6	-47.7	-48.8	-49.9	-163.0	-489.2
<i>Component 3k</i>	-40.2	-41.1	-42.1	-43.2	-44.3	-45.4	-46.5	-47.6	-48.8	-49.9	-51.1	-166.6	-500.1
<i>Component 3l</i>	-48.4	-49.6	-50.7	-52.0	-53.3	-54.7	-56.0	-57.4	-58.7	-60.1	-61.6	-200.7	-602.6
<i>Refundable company tax offset expense – Component 4b</i>	-200.0	-350.0	-470.0	-480.0	-500.0	-520.0	-550.0	-570.0	-600.0	-630.0	-640.0	-1,500.0	-5,510.0
<b>Total – administered</b>	<b>-1,149.6</b>	<b>-1,326.9</b>	<b>-1,464.2</b>	<b>-1,503.5</b>	<b>-1,553.2</b>	<b>-1,593.2</b>	<b>-1,653.6</b>	<b>-1,694.5</b>	<b>-1,755.5</b>	<b>-1,817.1</b>	<b>-1,849.3</b>	<b>-5,444.1</b>	<b>-17,360.8</b>
<i>Departmental<sup>(c)(d)</sup></i>													
<i>DIIS – Component 3</i>	-11.6	-11.6	-11.7	-11.8	-12.1	-12.4	-12.9	-13.5	-14.2	-15.1	-16.2	-46.6	-143.0
<i>CSIRO – Component 4a</i>	-37.1	-37.1	-37.1	-	-	-	-	-	-	-	-	-111.4	-111.4
<i>ANSTO – Component 4a</i>	-9.2	-9.2	-9.2	-	-	-	-	-	-	-	-	-27.5	-27.5
<i>AIMS – Component 4a</i>	-2.6	-2.6	-2.6	-	-	-	-	-	-	-	-	-7.8	-7.8
<b>Total – departmental</b>	<b>-60.5</b>	<b>-60.5</b>	<b>-60.6</b>	<b>-11.8</b>	<b>-12.1</b>	<b>-12.4</b>	<b>-12.9</b>	<b>-13.5</b>	<b>-14.2</b>	<b>-15.1</b>	<b>-16.2</b>	<b>-193.3</b>	<b>-289.7</b>
<b>Total – expenses</b>	<b>-1,210.1</b>	<b>-1,387.4</b>	<b>-1,524.8</b>	<b>-1,515.3</b>	<b>-1,565.3</b>	<b>-1,605.6</b>	<b>-1,666.5</b>	<b>-1,708.0</b>	<b>-1,769.7</b>	<b>-1,832.2</b>	<b>-1,865.5</b>	<b>-5,637.4</b>	<b>-17,650.5</b>
<b>Total</b>	<b>-1,210.1</b>	<b>-1,567.4</b>	<b>-1,654.8</b>	<b>-1,655.3</b>	<b>-1,725.3</b>	<b>-1,775.6</b>	<b>-1,846.5</b>	<b>-1,898.0</b>	<b>-1,979.7</b>	<b>-2,052.2</b>	<b>-2,095.5</b>	<b>-6,107.4</b>	<b>-19,490.5</b>

(a) A positive number for the fiscal balance indicates an increase in revenue or a decrease in expenses or net capital investment in accrual terms. A negative number for the fiscal balance indicates a decrease in revenue or an increase in expenses or net capital investment in accrual terms.

(b) Figures may not sum to totals due to rounding.

(c) Departmental cost estimates are based on similar-sized grant programs and account for the net effect of indexation parameters and the efficiency dividend, in accordance with the Department of Finance's costing practices.

(d) Departmental expenses have not been calculated for Components 1, 2, 3a, 3b, 3c, 3e, and 4b as it is anticipated that these components would not significantly increase the administrative workload of the relevant department.

- Indicates nil.

**Table A2: Put Australia on a path to achieve 4 per cent of gross domestic product (GDP) in science, research and innovations spending— underlying cash balance (\$m)<sup>(a)(b)</sup>**

	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	2029–30	Total to 2022–23	Total to 2029–30
<b>Receipts</b>													
<i>Company tax receipts – Component 1</i>	-	-10.0	-10.0	-20.0	-30.0	-30.0	-30.0	-30.0	-40.0	-40.0	-40.0	-50.0	-280.0
<i>Company tax receipts – Component 4</i>	-	-170.0	-120.0	-120.0	-130.0	-140.0	-150.0	-160.0	-170.0	-180.0	-190.0	-420.0	-1,560.0
<b>Total – revenue</b>	-	-180.0	-130.0	-140.0	-160.0	-170.0	-180.0	-190.0	-210.0	-220.0	-230.0	-470.0	-1,840.0
<b>Payments</b>													
<i>Administered</i>													
<i>Reinstating sustainable research excellence – Component 2</i>	-220.0	-230.0	-230.0	-240.0	-250.0	-250.0	-260.0	-260.0	-270.0	-280.0	-280.0	-920.0	-2,770.0
<i>Component 3a</i>	-88.9	-91.0	-93.1	-95.4	-97.8	-100.2	-102.7	-105.3	-107.9	-110.6	-113.4	-368.3	-1,106.3
<i>Component 3b</i>	-83.3	-85.2	-87.2	-89.4	-91.6	-93.9	-96.3	-98.7	-101.1	-103.7	-106.2	-345.1	-1,036.6
<i>Component 3c</i>	-33.3	-34.1	-34.9	-35.7	-36.6	-37.5	-38.5	-39.4	-40.4	-41.4	-42.5	-138.0	-414.4
<i>Component 3d</i>	-48.4	-49.6	-50.7	-52.0	-53.3	-54.7	-56.0	-57.4	-58.7	-60.1	-61.6	-200.7	-602.6
<i>Component 3e</i>	-175.0	-179.1	-183.2	-187.8	-192.5	-197.3	-202.2	-207.3	-212.5	-217.8	-223.2	-725.0	-2,177.7
<i>Component 3f</i>	-14.5	-14.9	-15.2	-15.6	-16.0	-16.4	-16.8	-17.2	-17.6	-18.0	-18.5	-60.2	-180.7
<i>Component 3g</i>	-68.3	-69.9	-71.5	-73.3	-75.2	-77.0	-78.9	-80.9	-82.8	-84.8	-86.8	-283.0	-849.5
<i>Component 3h</i>	-44.6	-45.7	-46.8	-48.0	-49.2	-50.4	-51.6	-52.9	-54.2	-55.5	-56.7	-185.1	-555.6
<i>Component 3i</i>	-45.4	-46.5	-47.6	-48.8	-50.1	-51.3	-52.6	-53.8	-55.1	-56.4	-57.8	-188.4	-565.5
<i>Component 3j</i>	-39.3	-40.2	-41.2	-42.3	-43.3	-44.4	-45.5	-46.6	-47.7	-48.8	-49.9	-163.0	-489.2
<i>Component 3k</i>	-40.2	-41.1	-42.1	-43.2	-44.3	-45.4	-46.5	-47.6	-48.8	-49.9	-51.1	-166.6	-500.1
<i>Component 3l</i>	-48.4	-49.6	-50.7	-52.0	-53.3	-54.7	-56.0	-57.4	-58.7	-60.1	-61.6	-200.7	-602.6
<i>Refundable company tax offset payment – Component 4</i>	-	-200.0	-350.0	-470.0	-480.0	-500.0	-520.0	-550.0	-570.0	-600.0	-630.0	-1,020	-4,870
<b>Total – administered</b>	<b>-949.6</b>	<b>-1,176.9</b>	<b>-1,344.2</b>	<b>-1,493.5</b>	<b>-1,533.2</b>	<b>-1,573.2</b>	<b>-1,623.6</b>	<b>-1,674.5</b>	<b>-1,725.5</b>	<b>-1,787.1</b>	<b>-1,839.3</b>	<b>-4,964.1</b>	<b>-16,720.8</b>
<i>Departmental<sup>(c)(d)</sup></i>													
<i>DIIS – Component 3</i>	-11.6	-11.6	-11.7	-11.8	-12.1	-12.4	-12.9	-13.5	-14.2	-15.1	-16.2	-46.6	-143.0
<i>CSIRO – Component 4a</i>	-37.1	-37.1	-37.1	-	-	-	-	-	-	-	-	-111.4	-111.4
<i>ANSTO – Component 4a</i>	-9.2	-9.2	-9.2	-	-	-	-	-	-	-	-	-27.5	-27.5
<i>AIMS – Component 4a</i>	-2.6	-2.6	-2.6	-	-	-	-	-	-	-	-	-7.8	-7.8
<b>Total – departmental</b>	<b>-60.5</b>	<b>-60.5</b>	<b>-60.6</b>	<b>-11.8</b>	<b>-12.1</b>	<b>-12.4</b>	<b>-12.9</b>	<b>-13.5</b>	<b>-14.2</b>	<b>-15.1</b>	<b>-16.2</b>	<b>-193.3</b>	<b>-289.7</b>
<b>Total – payments</b>	<b>-1,010.1</b>	<b>-1,237.4</b>	<b>-1,404.8</b>	<b>-1,505.3</b>	<b>-1,545.3</b>	<b>-1,585.6</b>	<b>-1,636.5</b>	<b>-1,688.0</b>	<b>-1,739.7</b>	<b>-1,802.2</b>	<b>-1,855.5</b>	<b>-5,157.4</b>	<b>-17,010.5</b>
<b>Total</b>	<b>-1,010.1</b>	<b>-1,417.4</b>	<b>-1,534.8</b>	<b>-1,645.3</b>	<b>-1,705.3</b>	<b>-1,755.6</b>	<b>-1,816.5</b>	<b>-1,878.0</b>	<b>-1,949.7</b>	<b>-2,022.2</b>	<b>-2,085.5</b>	<b>-5,627.4</b>	<b>-18,850.5</b>

(a) A positive number for the underlying cash balance indicates an increase in receipts or a decrease in payments or net capital investment in cash terms.

A negative number for the underlying cash balance indicates a decrease in receipts or an increase in payments or net capital investment in cash terms.

(b) Figures may not sum to totals due to rounding.

(c) Departmental cost estimates are based on similar-sized grant programs and account for the net effect of indexation parameters and the efficiency dividend, in accordance with the Department of Finance’s costing practices.

(d) Departmental expenses have not been calculated for Components 1, 2, 3a, 3b, 3c, 3e, and 4b as it is anticipated that these components would not significantly increase the administrative workload of the relevant department.

- Indicates nil.