

## 2019 Federal Election – STA Policy Survey

In the lead up to the 2019 Election, Science & Technology Australia (STA) reached out to the major parties for responses to issues of significance to the science, technology, engineering and mathematics sector. We received responses from the Labor Party, the Greens, and the Coalition.

The focus for STA was to gauge the commitment of each party to long term vision, stable investment, and stability for the STEM sector.

To summarise the responses:

- **The Coalition** has signalled a 'business-as-usual' approach if elected, with an ongoing commitment to their 2017 National Science Statement but no major new funding announcements for research or infrastructure. In education, it has committed to building STEM skills for the existing workforce through new VET funding.
- **The Labor party** has committed to working towards total national R&D funding of 3% of GDP by 2030 and a root and branch system-wide review, with a view to leverage business investment. It's committed to re-establishing the Education Investment Fund for university research infrastructure, removing caps on undergraduate university places and increasing VET investment.
- **The Greens** have laid out an ambitious approach to STEM, working towards total national R&D funding of 4% of GDP by 2030, a \$2bn boost to infrastructure, and investing in improving teacher STEM skills and the VET system.

Below, you will find the parties' responses in full. In the following areas of interest:

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## 1) Long term vision for STEM research and development

A broad overview of your intentions for the STEM sector and how your party would strengthen investment in R&D.

Please outline the role you see for science and technology in Australia's future, and how STEM will be supported and funded by government over the coming decade to fulfil this role.

*Q: What is your vision for the STEM sector over the next decade? Will you formalise this vision in government?*

### Coalition

The Morrison Government understands the importance of science and technology to our economy and society. We are committed to the vision we set out in the 2017 National Science Statement - an Australian society engaged in and enriched by science.

The 2017 National Science Statement sets out four key aims: engage all Australians with science; build our scientific capability and skills; produce new research, knowledge and technologies; and improve and enrich Australians' lives through science and research.

The Morrison Government's strong economic management will see Australia's science and technology sector continue to expand, create more jobs and improve our quality of life - without increasing taxes to pay for it.

### Labor

Ideas have the power to transform our nation and build a richer, fairer and more sustainable future. Science includes attempting to understand the world in all its forms. It is not confined to any one discipline. We turn to science and research to understand the world, and through that understanding, to help change it.

Australia's unique situation – as a large country with a small population; as custodians of fragile and unique ecosystems; and as a developed, responsible democracy – demands we invest in the science and research that will underpin Australia's wellbeing in the 21st century. We recognise the imperative of harnessing new ideas, processes and technologies for the benefit of all Australians, including future generations.

Australia today is competing in a global innovation race. To secure our future prosperity, Labor has set a national goal of 3 per cent of GDP to research and development by the end of the next decade. Australia must put innovation, science and research at the heart of industry policy. We must foster a culture of entrepreneurialism across the economy, from start-ups to established businesses and within the public sector.

The focus of Labor's innovation, industry, science and research policy is to both create jobs and to create a better Australia – a fairer, richer, healthier and greener Australia that can meet the challenges of the 21st century.

To create good jobs and keep pace with rapid advances in technology, Australia must retain and expand its science and research capabilities. Unless we are a country that has new ideas, makes better products and develops new services, our economy will become dependent on fluctuating commodity prices; we will lose vital skills and expertise; and we will miss the opportunity to improve Australia's health, environment and society.

Only by extending our knowledge, skills and technological capabilities and diversifying Australia's economic base will we be able to compete effectively in global markets.

Creating the jobs of the future depends on the strength of our national innovation system. It is the key to Australia's future prosperity. Science and research form the bedrock of a healthy innovation system and a modern advanced economy. Without a pipeline of basic science and research, there will be no Australian ideas of the future for us to commercialise.

The key to formalising this vision in government is the target of ensuring that 3 per cent of GDP is devoted to science and research by 2030. The National Review into Research in Australia will be tasked with advising government on the measures needed to organise our science and research effort, in order to mobilise the resources of government, the science and research sector, and industry to achieve this target.

## Greens

The Greens' recently announced our costed policy to put Australia on a pathway to reaching 4% investment of GDP in science, research and innovation.

The Greens' plan injects \$19.4 billion into the sector over the next decade, reversing funding cuts to key institutions, including the CSIRO, continued funding for the Medical Research Future Fund and over \$2.5 billion for a suite of measures to support equitable and ongoing employment opportunities for researchers, including a 'Secure Work for Researchers' fund to assist universities and research institutes to transition their workers to ongoing, secure employment and targeted support for women in science.

The Greens want a strong research sector in Australia to help move away from the polluting industries of the past and deliver the jobs of the future. We'll improve access to information, foster international collaboration, protect key research institutions and fund the research and innovation Australia needs. We must make life and work more secure for our researchers. Commonwealth investment in research and development is at its lowest level in 40 years. Our plan is to make Australia a world leader, not a laggard.

Our policy is fully funded.

## 2) Investment in science

Australia's investment in research and development in 2015/16 was 1.88% of GDP, well below the average of 2.36% among OECD nations. Long-term, strategic investment must be made, by both government and business, if we are to keep up with competitors in our region and around the world.

*Q: Will you commit to making Australia a global top 10 investor in R&D by 2025 (as a % of GDP)?*

*Q: Will you commit to increasing research funding to meet inflation each year?*

*Q: How will your government support public research agencies (like CSIRO, Geoscience Australia, the Bureau of Meteorology and others) and protect them from efficiency dividends?*

*Q: Regarding industry research and development, how will you increase private investment and facilitate better collaboration between research and industry?*

## Coalition

The Coalition's strong economic management has allowed significant investments in the science sector, including:

- \$335 million to establish the Australian Space Agency and create an Australian space industry, with the aim of tripling Australia's space sector to \$12 billion by 2030 and create up to 20,000 new jobs.
- \$4.2 billion in long-term funding for research infrastructure to unlock new discoveries and provide researchers with the access they need to cutting-edge facilities like supercomputers, the CSIRO's RV Investigator research vessel and the National Imaging Facility.
- \$1.5 billion more for science agencies than the previous Labor government provided, including:
- \$97 million more for the Commonwealth Scientific and Industrial Research Organisation (CSIRO).
  - \$126 million more for Australia's Nuclear Science and Technology Organisation (ANSTO).
  - \$53 million more for the Australian Institute of Marine Science (AIMS).
  - \$100 million more for the Australian Centre for international Agricultural Research (ACIAR).
  - \$1.1 billion more for the Australian Renewable Energy Agency (ARENA).
  - \$20 billion Medical Research Future Fund to super-charge growth in cutting-edge health and medical research, leading to new cures and treatments.

Since 2013, there has been a 64 per cent increase in research contracts with industry to help commercialise new ideas. The Morrison Government has

strengthened industry-research collaboration, including reforming research block grants to provide university researchers with greater incentives to work with business to commercialise discoveries.

The Morrison Government is committed to direct support measures to encourage greater levels of industry-research collaboration, including:

- more than \$700 million over the forward estimates to industry-research collaboration through the Cooperative Research Centres Program, including:
  - \$25 million for the Future Battery Industries Cooperative Research Centre (CRC) to expand minerals production in areas like lithium and develop opportunities for specialist battery manufacturing in Australia
  - \$55 million for the SmartSat CRC to develop game-changing satellite and communications technologies
  - \$70 million for the Blue Economy CRC to grow our marine industries like offshore aquaculture and marine renewable energy technologies
- establishing six industry-led Growth Centres that are helping businesses and researchers work together in fields such as advanced manufacturing, med-tech, food and agribusiness, energy, cyber security, and mining equipment and services
- supporting initiatives that encourage businesses to invest in R&D, including the ARC Linkage grants, the Entrepreneur's Programme, the CSIRO Innovation Fund and CSIRO-ON program, tax incentives for early stage investors, and a Global Innovation Strategy.

## Labor

***Q: Will you commit to making Australia a global top 10 investor in R&D by 2025 (as a % of GDP)?***

A Shorten Labor Government will set a national target that three per cent of GDP will be devoted to R&D by 2030.

Long-term sustainable growth, particularly in developed economies, rests ultimately on expanding the frontiers of knowledge. R&D contributes to growth primarily through creating technological progress, improving efficiency and generating new economic value through new products and services, and by delivering highly skilled workers to the labour force. R&D investment generates strong positive economic returns.

No country will be able to build sustainable and long-term prosperity simply from cheap labour, proprietary capital or natural resources. Economists have been clear for decades that the drivers of long-term growth are innovation, technological progress and new ideas. Australia has to compete on the basis of its research and innovation capacity, not least because its comparative advantage is disproportionately derived from R&D and innovation intensive sectors.

We are committed to restoring our international competitiveness, and will work with business, industry, universities and research institutes to do so.

***Q: Will you commit to increasing research funding to meet inflation each year?***

***When Labor was last in government, we ensured that there was consistent Commonwealth investment in innovation and science. We increased investment in innovation, science and research by 50 per cent, from \$6.6 billion to \$9.9 billion. We remain committed to continuing to increase base funding by CPI.***

A Shorten Labor Government will be committed to building the science and research base required for our nation to shape its own destiny in a complex and unpredictable world. Public investment in research is the crucial enabler of the inspired risk-taking that builds national wealth in the fullest sense – cultural, social, environmental and economic.

Our future rests on our capacity to embrace research as part of the fundamental fabric of our country. For too long, our research has drifted without a national strategy, a champion in government or a vision worthy of our true potential. Funds have been stripped and programs abolished without understanding or regard for the flow-on effects.

As a vital first step, we will commission a National Review into Research in Australia to assess the overall support framework for research and to understand what measures we need to take to position our researchers for the important contribution we rely on them to make.

***Q: How will your government support public research agencies (like CSIRO, Geoscience Australia, the Bureau of Meteorology and others) and protect them from efficiency dividends?***

Labor values the expertise and experience of our public servants, from service delivery staff, engineers, scientists, national security professionals, policymakers and the raft of other public service employees who do an excellent job of making Australia a world leader in so many areas through their contributions.

Labor rejects Mr Morrison's cutting of jobs and stripping of rights, and a Shorten Labor Government will quickly, fairly and equitably fix the mess.

We will not proceed with the remaining 0.5 per cent additional efficiency dividend next financial year, thereby saving an estimated 550 jobs and ensuring that valuable experience, expertise and corporate memory are retained within the Australian public service. Further, the APS staffing cap will be removed from public research agencies.

Furthermore, a Labor Government will commit \$10 million to boost the capabilities of the CSIRO Climate Science Centre; better coordinate Australian climate science; and develop an Australian climate science capability plan. Australia should never again be faced with the threat of our national science agency being forced to exit the field of climate science, or sacking hundreds of



climate scientists, as happened under the Liberals in 2016. That is why a Shorten Labor Government will develop a national climate science capability plan with the assistance of a National Scientific Expert Panel and the National Climate Science Advisory Committee.

Labor will also invest in the infrastructure and capability of Australian inshore marine science, including a refurbishment of Australia's world class Great Barrier Reef education and research facility, Reef HQ Aquarium. It will provide an additional investment to bring about a step change in capability for the Australian Institute of Marine Science by providing resourcing to invest in technological change and employ additional scientists and technologists. It will also refit and extend the life of the RV Cape Ferguson, which is the inshore research vessel for the Great Barrier Reef.

Labor's marine science package will also invest in a new Australian Research Council special research initiative to conduct vital research supporting the social and economic adaptation of communities to the challenges of reef restoration and adaptation. Labor will also invest \$30 million in Reef HQ. Labor will refurbish this tired and aging facility and transform it into a National Education Centre for the Great Barrier Reef which all Australians can be proud of.

***Q: Regarding industry research and development, how will you increase private investment and facilitate better collaboration between research and industry?***

Labor supports the R&D Tax Incentive, which was created by a Labor government, as the principle means for encouraging industry research and development. It is the principal measure integrating the taxation and innovation systems, and it must be made to work effectively.

A properly functioning R&D Tax Incentive will be an essential measure in achieving Labor's goal of 3 per cent of GDP to be devoted to research and development by 2030.

The Government, in its recent legislation which failed to pass parliament, didn't consider worthy measures proposed in the original "Three Fs" review of the Incentive, such as the proposal for a premium rate of the tax incentive to be available for collaboration between industry and researchers in universities and government agencies. A Shorten Labor Government would consider implementing a premium rate.

## Greens

***Q: Will you commit to making Australia a global top 10 investor in R&D by 2025 (as a % of GDP)?***

Yes. The Greens recently announced a costed policy to put Australia on a pathway towards spending 4% of GDP on R&D by 2030.

***Q: Will you commit to increasing research funding to meet inflation each year?***

Yes

***Q: How will your government support public research agencies (like CSIRO, Geoscience Australia, the Bureau of Meteorology and others) and protect them from efficiency dividends?***

The Greens will restore funding for CSIRO and other research institutions. We would not support cutting funding to vital scientific and research organisations. Our plan is for an increased government spend on public research, including an additional \$40 million in annual government funding to the CSIRO.

***Q: Regarding industry research and development, how will you increase private investment and facilitate better collaboration between research and industry?***

The Greens will invest \$83.3 million to boost Cooperative Research Centres.

The Greens will oppose the \$2 billion in cuts to the R&D Tax incentive and we are open to implementing a 5% tax incentive to enable collaboration with CSIRO or other Federal public sector agencies.

The Greens will support and expand initiatives like the Medical Research Future Fund that encourage collaboration and the translation of research.

To encourage the employment of more PhDs in industry and to provide pathways outside of academia, the Greens will introduce a 20% non-refundable tax offset to businesses that employ PhD graduates in their field of expertise.



### 3) Science in Parliament

Science is a vital contributor to the health and well-being of Australian society, our environment, and the prosperity of our nation. If we are to achieve effective, evidence-based policy, and further strengthen the role of science and technology in decision making, we must have a voice at the Cabinet table - enshrined in a Federal Ministerial portfolio.

*Q: Do you plan to name a Minister for Science if elected to government at the next Federal Election?*

*Q: How would your government look to embed evidence and science in policy making?*

#### Coalition

The Hon Karen Andrews MP was sworn in as Minister for Industry, Science and Technology on 28 August 2018.

In November 2018, the Morrison Government announced the establishment of the National Science and Technology Council as the peak advisory body to the Prime Minister and other Ministers on science.

The Council includes a number of Australia's leading scientific and technology experts. Focusing on the key science challenges facing Australia, it will ensure the Government receives the best independent advice to inform decision-making.

#### Labor

*Q: Do you plan to name a Minister for Science if elected to government at the next Federal Election?*

Bill Shorten has made it clear, most recently in November last year that, "Science should be at the Cabinet table for the big decisions, in the room."

Unlike the Coalition which has had five ministers of science in six years, plus an assistant minister, and a period where there was no Minister for Science, Labor will place science at the centre of government.

*Q: How would your government look to embed evidence and science in policy making?*

Labor will end the war on science and research by resetting the relationship between the Federal Government and Australia's science and research community. We will:

- Develop a charter with the Australian science and research community to establish the reciprocal role and responsibilities of government and researchers.
- Establish a Prime Minister's Council for Science and Innovation, supported by a National Scientific Expert Panel.
- Review and strengthen the National Science and Research priorities, giving the priorities a central role in guiding government investments in innovation, science and research.

The **charter with the Australian science and research community** will be a compact between the government and the research community, in which the expectations of scientists and their obligations to the Australian people are clearly established, and the commitment and reciprocal responsibilities of scientists and government will be established.

Labor will establish a top-level **Prime Minister's Council for Science and Innovation**. Under Labor, the Council will be responsible for providing advice to the Prime Minister and other ministers on the implications of science, research, engineering and technology issues in the Australian context. It will advise a Shorten Labor Government on a strategic and whole-of-government approach to all aspects of science, technology, engineering, mathematics and innovation.

Membership of the Council will be the Prime Minister (Chair), a Cabinet level Minister with responsibility for Science (deputy Chair), the Minister for Education and Training, the Minister for Health, Australia's Chief Scientist (Executive Officer), five eminent and practicing scientists, social scientists or science educators (including at least one with a humanities or social sciences background), and four eminent business representatives.

The Council will be supported by a National Scientific Expert Panel that will provide policy advice on topics affecting the lives of Australians in the present and in the decade ahead. Labor will work with the learned academies, led by the Australian Academy of Science, to shape the form and function of this council.

Labor will review, refresh and properly monitor the **National Science and Research Priorities**. The priorities have an important role in guiding Australia's investment in our future. Under the Liberal Government they have been largely ignored and have become a meaningless tick and flick exercise. Labor will ensure that they are reviewed every two years.

## Greens

***Q: Do you plan to name a Minister for Science if elected to government at the next Federal Election?***

Yes we will.

***Q: How would your government look to embed evidence and science in policy making?***

The Australian Greens have been concerned by the growing evidence of political interference in scientific independence not just in Australia but around the world. The attack on climate science is only the most prominent example. In response, the Australian Greens have lead a community campaign for governments to Respect Research.

The Australian Greens support the development and implementation of a science integrity charter to ensure respect for science and research across all government policy making.

#### 4) STEM education and retraining

STEM skills are increasingly in demand as our economy becomes more technological – they’ll be some of the most important skills for a future Australian workforce, and without a foundation of science and maths education in primary and high school, this will be impossible to achieve.

*Q: How will you improve the delivery of and participation in science and maths education in Australian schools?*

*Q: What is your plan to inject STEM skills in to Australia’s existing workforce?*

*Q: What is your plan to improve performance and enrolment of science and maths students in Australia?*

#### Coalition

The Morrison Government is supporting STEM skills development in all stages of the pipeline, including early childhood education, secondary and post-secondary education, workforce skills, and STEM engagement and awareness.

An interest in science has to be fostered early. In 2015 we invested over 56½ million to fund early learning and school STEM initiatives. Programs like Curious Minds (which includes summer schools for STEM students) and Little Scientists (which helps early learning educators lead fun and inquiry-based learning activities using everyday materials) are making a real difference. We are also investing over \$20 million in gender equality initiatives for STEM, including appointing Australia’s first Women in STEM Ambassador.

We have commissioned the National Science and Technology Council to lead work on how to improve performance in science and maths enrolments. We are also investing an additional \$15.1 million for Questacon to expand its education and outreach programs to engage more kids in science and technology. The *Delivering Skills for Today and Tomorrow* package in the 2019-20 Budget also included \$62.4 million to establish a national program to deliver foundational skills training, including for numeracy and digital skills.

The Morrison Government is committed to making sure all Australians have the skills to equip them for jobs of the future. To ensure our children can compete for jobs in the coming decades, we need to build a stronger Australian workforce with more science, technology, engineering and mathematics skills

## Labor

### ***Q: How will you improve the delivery of and participation in science and maths education in Australian schools?***

Experts predict that in the years to come, 75 per cent of the fastest growing occupations will require skills in science, technology, engineering or mathematics (STEM). But we know that unless students are interested and engaged in STEM at an early age, they are unlikely to pursue a career in those fields.

Currently this isn't the case, with more children dropping out of STEM subjects with every additional year of study. This partly reflects the way STEM subjects are taught, but it also happens because our teachers aren't properly supported to engage young people's natural curiosity.

Nationally, around 60 per cent of information technology teachers and 40 per cent of general science and maths teachers teaching Years 7-10 classes do not have a tertiary qualification in those areas. We need to do more to support Australia's great teachers so that they can deliver STEM courses in a way that will inspire and engage young Australians.

A Shorten Labor Government will invest \$10 million to build a Science, Technology, Engineering, Arts and Mathematics (STEAM) Innovations Centre to best prepare the students of northern Melbourne for the jobs of the future. The Centre, based at the Northern College of the Arts and Technology in Preston, will be the first of its kind. The Centre will connect industry, universities, and local schools to create new forms of partnerships in education and research.

### ***Q: What is your plan to inject STEM skills into Australia's existing workforce?***

Australia is in transition. As we move away from the mining boom, our economy needs to diversify. Australia must play to its strengths and governments must be strategic in deciding where they should invest precious taxpayer dollars. We are a smart nation, able to thrive in the knowledge economy, to generate ideas that create jobs, to improve our living standards, solve our medical problems and remain globally competitive. But to stay in the race we cannot afford to take our foot off the accelerator.

Australia must ready itself to meet the demand of the 75 per cent of growing industries that are calling for workers with STEM skills. Countries such as China, USA, Brazil and Singapore have made record investments in science and technology because they have acknowledged the positive impact these fields have on jobs, their economies and their nations' productivity.

To maximise Australia's enormous human capital, to put to work Australian genius and to stay in the global race, we need to give Australia's best and brightest people the opportunities and support they need and the respect and reward they deserve.

That is why a Shorten Labor Government has placed science and technology at the heart of the national agenda. Labor will continue to support our world-class

science and technology industries to ensure they continue to provide diverse, creative and rewarding jobs and attract people with STEM skills to a range of interesting and exciting careers.

To be successful as an innovative nation that capitalises on its ideas, we must generate our own ideas first. And we cannot generate the ideas we need without a strong science and technology foundation.

Labor's measures will give mums and dads the confidence that their children will be equipped with the skills they need to participate in the knowledge economy and gain the jobs of the future - jobs we can be proud of, the foundation of a nation built on Australian genius, not low wages. This is the modern, smarter future Labor believes in.

***Q: What is your plan to improve performance and enrolment of science and maths students in Australia?***

Labor will remove the Liberals' cuts to the numbers of students enrolled in universities, including in science and maths courses.

A Shorten Labor Government will uncap university places – ensuring around 200,000 more Australians will get access to a university education during the next decade. The Liberals' cap means thousands of Australians will miss out on a university place. We believe that everyone with ability and dedication should get the chance to study at university.

Labor uncapped student places back in 2009, which by 2017 had seen extra 220,000 students get the opportunity of a university education. Many of these students were the first in their family to attend university. The uncapping of student places has seen more students study STEM at university, but Scott Morrison's cuts to university funding is placing this at risk.

## **Greens**

***Q: How will you improve the delivery of and participation in science and maths education in Australian schools?***

Ninety-three percent of public school teachers dip into their own pocket to buy stationery and classroom equipment, and nearly half buy library resources and textbooks to make up for the lack of Government funding. This is unacceptable and our plan to significantly boost public school spending will ensure teachers have the resources they need to teach.

A world class education can only happen in quality and comfortable learning environments for students and teachers. The Greens will expand the Capital Grants program to \$400m to assist in upgrading and building infrastructure, including facilities for delivering STEM education.

***Q: What is your plan to inject STEM skills in to Australia's existing workforce?***

The Greens' have a plan to invest over \$500 million over the next decade to expand existing teacher training in STEM education, as well as establishing an additional non-refundable tax offset of 20 per cent for companies that hire STEM PhD or equivalent graduates in their first three years of employment.

***Q: What is your plan to improve performance and enrolment of science and maths students in Australia?***

The Greens recognise the importance of STEM education for students. Under the current funding model, almost no public school is on track to be funded to a level that meets the educational needs of their students. That means subjects like maths and science are under-resourced.

Our plan for public schools will commit an additional \$4.6 billion for public schools over the next four years and \$20.5 billion over the next ten years. Under this plan, all public schools would reach 100% of their Schooling Resource Standard by 2023. This will ensure every public school in Australia has the funding to meet the educational needs of their students, no matter their postcode or their parents' bank balance. This will allow schools to properly resource STEM education.



## 5) A non-medical Research Future Fund

The early success of the Medical Research Future Fund (MRFF) is to be commended, and the future of medical research is looking strong thanks to this bold and brave investment.

The STEM sector proposes that a similar Fund be established, using new funds, to complement other science and technology fields and support the translational research in these areas.

*Q: Will you commit to scoping a Research Future Fund to invest in translational research for non-medical disciplines?*

### Coalition

The Morrison Government recognises the enormous potential of commercialising Australia's world-class research. We are already supporting a range of programs which support translational research, including the ARC Linkage grants, the Business Research and Innovation Initiative, the CSIRO Innovation Fund, and the Cooperative Research Centres program.

This complements the significant investment we are making in translation of medical research, including the \$20 billion Medical Research Future Fund and the 5500 million Biomedical Translation Fund.

The Morrison Government will review, in consultation with the science and industry sectors, including the National Science and Technology Council, how to continue providing strong support for the translation and commercialisation of research.

### Labor

Labor will institute a once in a generation inquiry into the Commonwealth Government's research system, to be led by Professor Ian Chubb, former Chief Scientist of Australia and former Vice Chancellor of the Australian National University.

Australia's overall research framework and its coherence have not had serious review for years. In the meantime, marginal changes have been made to policy, funding cuts have been imposed and political interference has left behind a system that could benefit from a root-and-branch examination.

This is not novel or unique to Australia. Most notably both the United Kingdom and Canada have recently undertaken and implemented reviews to ensure that maximum value is obtained from the public investment in research.

We must ensure that Australia maintains its international competitive advantage, and that we do not lose our capacity to attract and retain the world's best researchers.

The Abbott-Turnbull-Morrison Government has broken the relationship between the Commonwealth and the Australian research community. They have constantly interfered and manipulated on political and ideological grounds. Time and time again they have demonstrated their contempt for Australia's research enterprise. Under Labor this will change.

## Greens

Yes, the next government should evaluate a mechanism for establishing such a fund. The Greens know that by closing unfair tax loopholes and corporate handouts, Australia would be able to spend additional funding on important research and development.

## 6) Research Infrastructure funding

The STEM sector is energised following the establishment of a long-term plan for critical research infrastructure, however, it is important to understand what the sector's role will be in the determination of future funding and planning.

*Q: Do you plan to continue the current model of supporting critical research infrastructure? What changes would you seek and how would you consult with the STEM sector?*

### Coalition

Australia produces some of the world's best science and scientists, but we know there is always room to do more. The Morrison Government recognises that in order to deliver the best science, we need to invest in the best capability.

That is why the Coalition responded to the sector's call for long-term certainty and stability for national research infrastructure funding, with \$1.9 billion in the 2018-19 Budget. The investment will unlock new discoveries, providing researchers, universities and businesses with the access they need to cutting-edge facilities, including supercomputers, the CSIRO's RV Investigator research vessel and the National Imaging Facility. Investment plans will be developed regularly to reaffirm and update investment activities. The Government will seek advice to ensure eminent experts across the NRI sector are informing Government decision making.

This investment came on top of the 52.3 billion we committed to research infrastructure in 2015, with almost 5300 million invested in hosting the largest telescope in the world, Western Australia's Square Kilometre Array, and 5520 million for the Australian Synchrotron.

### Labor

Australia's scientists and researchers need world-class infrastructure to make breakthrough discoveries. We remain committed to delivering the research infrastructure Australia needs in the 21st century.

Investing wisely in research infrastructure will benefit the economy by fostering innovation and new ideas, boosting productivity and creating jobs. Excellent research required excellent research infrastructure. Australia's national research infrastructure facilities employ significant numbers of people across the country. National Collaborative Research Infrastructure Strategy facilities alone employ well over 1,700 staff across 222 institutions and many more are employed at facilities like the Synchrotron, the OPAL reactor and the RV Investigator. Investment in research infrastructure means new jobs in construction of new research facilities; in maintenance and upgrading of existing facilities; and in operating those facilities.

Regrettably in framing the National Research Infrastructure Investment Plan, the Liberal Government has ignored its own Research Infrastructure Review, the

Chief Scientist and the National Research Infrastructure Roadmap; all of which called for better governance and transparency of decision making in decisions to fund national research infrastructure. The continuing reluctance of the Department of Education to prioritise the development of National Research Infrastructure for the humanities and social sciences is a matter Labor will seek – within current resources – to redress.

Labor will consult with the sector to develop an appropriate governance framework for investment decisions on research infrastructure. Any governance vehicle would involve research and science sector representation.

However, Australia is still without a long-term dedicated funding vehicle for university infrastructure. Since the Government decided to abandon the highly successful Education Investment Fund (EIF), Australia's research institutions and universities have had no access to specific funding for research equipment, new laboratories or renovation of existing facilities. EIF was established to provide co-investment for critical infrastructure and research in Australia's research institutions, universities and TAFEs. The \$3.9 billion fund now lies dormant in the Future Fund. Research institutions, universities and TAFEs are forced to fund infrastructure through vastly depleted operating grants. Labor has successfully resisted three attempts by the Liberal Government to close the EIF, which now stands at \$3.9 billion. We have established a \$300 million University Future Fund to invest in urgent teaching and research projects at Australian universities.

## Greens

The Greens propose to maintain but properly fund the infrastructure driving investment in research. Our plan will provide

- A \$2.557 billion boost to the 'Protecting Science' package, consisting of the Australia Research Council, National Health & Medical Research Council, and Cooperative Research Centres over the next decade;
- \$1.054 billion to promote health and medical research by supporting the maintenance and disbursement of the Medical Research Future Fund; funding four new integrated health research centres; and increasing funding for health and medical research;
- \$2.177 billion to fund the Research Infrastructure Investment Strategy. At the moment, there have been good infrastructure roadmaps developed, but no funding to implement them. The Greens will provide that funding; and
- Restoring the Sustainable Research Excellence program and boosting university research.

## 7) Bridge the gender gap and support diversity and inclusion in STEM

Important foundational work has been undertaken to begin bridging the gender gap in the STEM sector. However, there is more to be done to increase enrolment, improve diverse participation, and provide equal access to opportunities to excel in the STEM sector.

*Q: How will your party support systemic change to improve diversity and inclusion in the sector?*

### Coalition

The Morrison Government is committed to gender equality in STEM. The Coalition are the only party to have supported programs targeted at lifting the participation of girls and women in science - with investments of over \$20 million.

Initiatives are centred on raising awareness and prosecuting the case for change. This includes support for the establishment of the Science in Australia Gender Equity (SAGE) program to advance workplace gender equity and inclusiveness in science and technology organisations, as well as appointing Australia's inaugural Women in STEM Ambassador as a strong advocate for equality in science. We are making the government an exemplar, with Industry, Science and Technology Portfolio Boards now having 54.4 per cent women representation.

### Labor

Women are underrepresented in many STEM fields, particularly in mathematics, physics, engineering and information and communications technology; in industry sectors such as construction and transport; and in senior positions in these fields. Impediments to women in STEM have deep societal, cultural and institutional origins. Australia's future wellbeing and advancement will be built upon a STEM literate workforce; to succeed, this workforce must fully engage women.

A Shorten Labor Government will create Australia's first National Evaluation Framework for Girls and Women in STEM Initiatives. There are more than 300 initiatives to support women and girls' participation in STEM fields around the country - we need to find out what's working best to shape future investment.

Labor will also fund the Science and Gender Equity (SAGE) program to drive gender equity in science and research institutions, establish a National Women in Science Day and work with the Australian Research Council and Medical Research Council to find structural fixes to barriers to women's participation in research.

## Greens

The Greens believe in funding education and investment opportunities to foster the participation of women and other under-represented groups in science and technology. The Greens believe that we must make life and work more secure for our researchers and that we also need to do more to support women who take time out of the science and research workforce to have children.

The Greens will spend over \$2.5 billion over the decade to support equitable and ongoing employment opportunities for researchers by:

- Establishing a 'Secure Work for Researchers' fund to assist universities and research institutes to transition their workers to ongoing, secure employment;
- Providing support for women in science and;
- Ensuring additional funding to support early and mid-career researchers to attract and retain top research talents



## 8) International Collaboration

Australia is a strong performer for its population size when it comes to research output in science and technology. However, if we are to have any hope of tackling the most complex questions, we must be able to collaborate with the best and brightest wherever they may be, in our region and the rest of the world.

*Q: What policies do you have to invest strategically to strengthen Australia's international science effort, in our region and beyond, to boost collaboration with the best and brightest wherever they are based?*

### Coalition

The Coalition has a strong track record of investing in international collaboration in science and innovation. This includes bilateral programs such as the Australia-China Science and Research Fund and the Australia-India Strategic Research Fund, together with competitive research funding through the National Health and Medical Research Council and the Australian Research Council. Programmes like the Cooperative Research Centres also enable our researchers and industry to engage globally.

Australia's membership of specialist international groups provides our scientists and researchers with world-class infrastructure and networks at home and overseas. These include the Square Kilometre Array radio telescope project in Western Australia (which Australia co-hosts), for which the Government is investing almost \$300 million.

Investment to support international collaboration by the Coalition also includes:

- \$20 million for Supporting Australian innovation in Asia, including the recently announced collaboration between CSIRO and Singapore's Agency for Science, Technology and Research (A\*STAR) on precision health
- \$4.9 million Global Connections Fund
- \$16.5 million Global Innovation Linkages
- \$11.2 million Landing Pads
- \$3.2 million Regional Collaborations Programme

By keeping the economy strong, this Government can continue to make sustained and well targeted investments in science.

### Labor

Knowledge knows no borders. For Australia to be positioned as a respected, important and capable partner in the world we need strong international networks and projects that range from collaborations between individual researchers to high level strategic government to government agreements. This must be underpinned by an international engagement strategy that supports our broader national interest. It is not acceptable to seek partnerships and collaboration with leading research nations without having something on the

table to offer. Our future engagement with these economies will require the ability to link in with their science and innovation establishments.

We must position Australia and Australians to excel. Labor will give Australian scientists and researchers the chance to collaborate and compete on the global stage. The great leaps of the past century were made possible by scientific experiments on a massive scale, far beyond the resources of any one nation. Australia should contribute our research strengths to international collaborative missions such as the European Molecular Biology Laboratory, the International Census of Marine Life and major astronomy projects like the Square Kilometre Array.

Labor will support researchers from all disciplines to collaborate with their colleagues abroad; encounter new ideas; and form and maintain valuable research networks with the best minds on the planet.

A Shorten Labor Government will continue to support our current international science commitments including the Global Connections Fund, the Australia-China Science and Research Fund and the Australia-India Strategic Research Fund.

A Shorten Labor Government will also establish a new SMART Visa for world-leaders in Science, Medicine, Academia, Research and Technology to ensure universities, research institutes, medical, scientific and advanced technology industries and companies and public research agencies to bring the best and brightest here.

## Greens

As part of the Greens' policy to put Australia on a pathway to investing 4% of GDP in R&D by 2030, the Greens will provide \$60.2 million over the forward estimates to invest in strategic opportunities for international collaboration; and provide \$185.1 million over the forwards to ensure Open Access Publishing of Government funded research.