We need a strong research sector in Australia to help move us away from the industries of the past and to deliver the jobs of the future. The Greens have a plan to increase our investment in research and target that investment strategically.

> A ROAD MAP TO INCREASE R&D INVESTMENT TO 3% OF GDP

Australia has a strong history of science and innovation. We have all benefitted from life-saving discoveries made by Australia’s outstanding researchers. As we move into an increasingly complex and resource constrained future, our national wellbeing will become ever more dependent on further advances. Australia is in the perfect position to become a leader in the global transition to knowledge-based economies. To do so, we need a robust and nimble research sector, with the ability to tackle the difficult problems that we face.

Australia currently invests 2.2% of GDP in research and innovation from both private and public sources, the equivalent of about $900 per person per year. This is well behind regional competitors Korea and Japan, behind the United States, and even further behind world leaders such as Israel, Finland and Sweden. Australian investment in research and innovation ranks only 13th among OECD member countries, significantly below the OECD average. Worst of all, our public sector investment has been on the decline in recent years; the Chief Scientist has recently warned it is likely to fall further.

The Greens believe that we need a strong research sector in Australia to help move away from the industries of the past, and to deliver the jobs of the future. This will mean ensuring that every dollar spent on research is spent well, and that our great public research agencies (like the CSIRO, Universities and Medical Research Institutes) work together with each other, with industry and with international partners. We must increase our investment in research and target that investment strategically. We must deliver a stable and dependable funding environment to free our researchers from a rolling funding shortfall.

The Greens aim to increase Australia’s investment in research and innovation to 3% of GDP by 2020. We will deliver this increase through smart and effective programs designed to maximise the return on our investment.

Over the coming years our research investment plan will help deliver a highly skilled workforce, necessary research infrastructure and incentives for business to participate. We will increase funding, improve access to information, foster national and international collaboration, and deliver the research and innovation Australia needs to remain competitive in an increasingly competitive world. Our roadmap to reach 3% of GDP by 2020 includes:

- A ‘Future Science’ package, consisting of a combined $750 million boost to the Australia Research Council, National Health & Medical Research Council and to Cooperative Research Centres;
- Funding for indirect costs associated with health and medical research ($141m);
- Steps towards default 5 year grants in ARC and NHMRC;
- $342m to reverse short-sighted Government cuts to the Sustainable Research Excellence program;
- A new National Research Infrastructure Facilities Council ($230m)
- Strategic opportunities for international collaboration ($150m)
- An ongoing Future Fellowships scheme to attract and retain top research talents ($100m)
- Open Access Publishing of Government funded research ($138m)
- Targeted support for Health and Medical Research commercialisation, to keep development in Australia ($155m)
- Creation of new Integrated Health Research Centres to translate the research discoveries into clinical practice ($120m)
In addition to previously announced Greens initiatives for increased investment in agricultural research and development and Antarctic Research, this will provide an additional $2.5 billion investment in research and development over the forward estimates. Our commitment to 3% R&D is also supported by our commitment to reverse cuts to universities and boost base funding by 10%. This puts Australia on the path to reaching an R&D investment of 3% of GDP by 2020, if not earlier.

The Greens additionally commit to improving science teaching in all primary and secondary schools, and to working towards a scientifically skilled and technologically literate workforce and community that can take full advantage of the research we generate. The Greens will also maintain funding for other national research agencies not mentioned in this document. Our plan not only presents a strategic approach to research investment that will deliver long term benefits for our community, but also will engage with a community that will understand and engage with this exciting transformative venture.

The plan will be funded from announced revenue measures, including the abolition of fossil fuel subsidies. Abolishing one such subsidy alone – the diesel fuel rebate for miners, who pay only 6 cents a litre excise on purchases of diesel fuel, compared to ordinary consumers who pay 38 cents for their petrol – raises $7.1 billion over the forward estimates, more than double the cost of this R&D roadmap. Instead of propping up the industries of the past, the Greens will redirect that money to securing our future.

In accordance with standard federal Budget costing arrangements, costs here are presented over the forward estimates period. However, the Greens understand that much science & research funding needs to be planned over much longer time frames. Wherever possible, the Greens commit to securing funds for science & research well past the usual Federal Budget planning cycle.
> **FUTURE SCIENCE: A $750 MILLION FUNDING BOOST**

Australia’s economic future is as a knowledge and innovation economy. We need a serious investment in the research and innovation that will deliver us the jobs of the future. As part of our **Future Science** package, the Greens will commit $750 million to help drive Australia’s evolution from the lucky country to the smart country.

Every scientist knows that carrying out exciting research requires commitment and stability. We see **Future Science** as a way of permitting our talented scientists and engineers to try to solve the hard problems, in climate change, in agriculture, in health. It will also give scientists the confidence that they can stay in Australia, knowing funding is secure for the long term. Funding cannot continue in the “start-stop” way that both the Howard and the Rudd/Gillard governments have tried over the past 20 years; it just will not work.

Our **Future Science** package will also spearhead a move towards a five year funding cycle, to provide increased certainty for research grant recipients, but we see this as the beginning of a far more secure commitment to long term funding for the most important scientific problems facing Australia.

- **An additional $250 million will be provided to the Australian Research Council** to be awarded as competitive grants in accordance with identified national priorities over the next 3 years. This is in addition to the Greens commitment to secure the existing and projected ARC funding of $2.51 billion over the next 4 years. This represents an average yearly funding boost of over 10%;

- **An additional $250 million will be provided to the National Health and Medical Research Council** to be awarded as competitive grants in accordance with identified national priorities over the next 3 years. This is in addition to the Greens commitment to secure the existing and projected NHMRC funding of $2.66 billion over the next 4 years. This represents an average yearly funding boost of over 10%;

- **An additional $100 million will be allocated to fund Cooperative Research Centres** in accordance with identified national priorities over the next 3 years. This is in addition to the Greens commitment to secure the existing and projected CRC funding of $867 million over the next 4 years and in addition to the Greens commitments to Antarctic Research and to food & agricultural research.

**Longer-term and better funding arrangements**

The Greens understand the frustration many researchers feel with existing grant application requirements and processes. We also understand that the current process can mean significant job insecurity, especially for early- and mid-career researchers. The Greens will commit $750 million to help drive Australia’s evolution from the lucky country to the smart country.

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**Supporting women in science & research**

Women account for more than half of all undergraduate students in Australia, but are consistently underrepresented at the higher levels of the academy. This underrepresentation becomes even more pronounced in the science, technology and innovation fields. Of the 1700 plus researchers working at the CSIRO, only 21% are women; and women make up only 8.5% of ARC Federation Fellows, the fellowships designed to attract world-class researchers and world-class research leaders to key positions.

With many women leading their fields in science & research, it is vital that women’s place in Australia’s future is secured. Some of the barriers facing women are not unique to the science & research community, but can be exacerbated by the precarious employment status that often comes with grant-based funding.

By failing to retain more women in the fields of science and technology, Australia is losing the benefit of a significant proportion of our expertise. We need to develop career pathways that can accommodate competing demands, so as to retain the knowledge and skills of women and carers as they move through different periods of their working and personal lives.

The Greens will commit $50 million per year in grants to research and innovation organisations to help them develop strategic programs designed to help retain female workers and carers as they manage competing demands on their time. These programs may include part-time fellowships, childcare support, family friendly facilities or increased technical support while on maternity leave.
Organisations may also use the funds to undertake a review of their operations, designed to identify localised barriers to the retention of women in their employment, and to develop best practise policies that will generate positive organisational cultures which create contemporary and equitable workplaces that value diversity.

The Greens understand that Australia needs a highly skilled workforce that can rapidly adapt to meet future challenges, and that means we must learn to better retain our investment in human capital. The Greens will help the research community develop career pathways that accommodate women and carers as they manage their work-life balance.
SUSTAINABLE RESEARCH EXCELLENCE

The Greens will commit $342.5 million to reverse Government cuts to our most successful University research

Australian governments have a long history of supporting research in this country, and have recently developed a National Research Investment Plan that argues for ongoing and predictable funding for core research and innovation programs. The plan states that Australia’s research investment needs to provide a strong, sustainable capability in basic and applied research that can increase productivity and address Australia’s key challenges. We agree!

To meet these needs, in 2009 the Labor Government rolled out the Sustainable Research Excellence program, and then in spite of their own advice, promptly slashed $499 million from the program. These cuts were described by Australia’s elite research institutes as ill-conceived, short-sighted and would lead to research jobs and programs being lost, often to other countries with far-sighted research investment plans.

The Greens will reverse these funding cuts to the Sustainable Research Excellence as soon as possible, injecting $342.5 million over the forward estimates to restabilise this important funding stream.

The Greens understand that funding needs to be holistic, supporting all capital, maintenance and operating costs. Our commitment to the Sustainable Research Excellence program will help to cover the indirect costs of research, such as administration, equipment and staff, and enable our top-tier researchers to concentrate on the important work at hand.
RESEARCH INFRASTRUCTURE COUNCIL

The Greens will commit an additional $230 million towards critical national research infrastructure

National collaborative research infrastructure is necessary to deliver high quality research and innovation outcomes, to improve national wellbeing and to enable Australian researchers to address key challenges. It is internationally acknowledged that major national research infrastructure, equipment like the synchrotron and the square kilometre array, have a scale and cost that cannot be funded by business or individual research organisations, but require government investment, coordination and support.

Since 2001, the Australian Government has provided a series of funding programs for large-scale research infrastructure that were broadly successful and enjoyed community support. However, these arrangements are finishing, and under both the Coalition and Labor, have been “start/stop” and inconsistent. The funding has been fully allocated and the Government has lost momentum, resorting to interim measures. This uncertainty about future funding for research infrastructure, particularly the funding for operating costs and specialist staff retention, creates management difficulties and places Australia at risk of losing the highly-skilled workforce required for the operation of sophisticated facilities.

Currently, the NCRIS program is funded only over the next 2 years and only at the rates of $82.9 million and $102.9 million per year respectively. When this expires, the Greens will boost funding to $110m then $120m in 2015/16 and 2016/17 respectively, a total of $230m.

The Greens will commit this $230 million to be distributed by a National Research Infrastructure Council to continue the roll out and ongoing support of critical research infrastructure facilities in Australia.

The Research Infrastructure Council will provide certainty to advanced research and innovation sectors in Australia by delivering nationally-coordinated, long-term, dedicated operating-cost funding for existing infrastructure, as well as exploring new opportunities for advanced large scale collaborative research facilities. The Greens understand that infrastructure funding needs to be planned over a period of ten to fifteen years, not two years, and would continue to fund the Infrastructure Council over the longer term to guarantee stable and efficient use of our national facilities.

The Greens would seek the advice of the sector as to the appropriate composition of the National Research Infrastructure Council.
> AUSTRALIAN SCIENCE IN A CHANGING WORLD

The Greens will commit $49m over the next 3 years towards strategic opportunities for international collaboration

Australia cannot undertake science in isolation. Enhanced strategic ties to the knowledge produced elsewhere are essential in order to capture the benefits and advantages for Australia. If we do not network on an international scale, our best and brightest scientists will take their ideas overseas and stay there, and conversely we will not have access to world-leading thinkers working together with us.

The global scientific landscape is rapidly evolving, with much of the best research moving East and South. Australia has a closing window of opportunity to build on previous strengths and to forge new links with emerging R&D powerhouses in Asia and elsewhere. While other countries are responding to these changes with deliberate action, the Australian Government’s flagship program for strategic international science collaboration was terminated in June 2011. At the exact moment when scientific collaboration is shifting globally, the Australian Government is adrift at sea without an international engagement policy; the only countries where we still have funding allocations are China and India.

The Greens will fund a suite of programs to capitalise on this window of opportunity. In line with recommendations by the Australian Academy of Science, the Greens will improve our international competitiveness by funding:

- A program for early to mid-career researchers to establish partnerships with international leaders in their field, building the networks Australia needs for future innovation.
- Collaborative innovation projects to deliver industry and economic benefit for Australia through research links with overseas companies and facilities.
- Strategic partnerships determined by existing government priorities and cooperation agreements, supplementing and aligned with existing bilateral strategic partnership funds for India and China.

The Greens would fund this program for 10 years, at a cost of $49m over the next 3 years, as a necessary strategic investment on international collaboration.

By providing our best and brightest scientists with the opportunities to work with the best in their field, these programs will forge international links that will last a life time and deliver maximum returns on Australia’s scientific investment.
**FUTURE FELLOWSHIP SCHEME**

The Greens will commit an additional $100 million to funding the Future Fellowships program for a further 3 years after 2014.

Strategic and sustained investment in research programs like Future Fellowships leads to an increased domestic research capacity that enhances productivity and helps us address national challenges. The Future Fellowships programs provide salary grants to mid-career researchers over four years, to support them in undertaking research critical to our nation, be that medical innovation, engineering breakthroughs or strategies to address climate change.

Investment should be made with a view to sustaining the long term viability of Australia’s research and innovation capability. Funding for core research and innovation programs should be ongoing and predictable.

The Greens will maintain the current Future Fellowship funding of approximately $33m/year and boost it by $16.3m/year, committing an additional $101.5 million over the forward estimates.

This program provides opportunities for outstanding Australian researchers to perform research of critical national importance in Australia. By providing incentives to attract and keep our best and brightest researchers based in Australia, we are building and sustaining the high level workforce and capabilities to ensure the health and vitality of our research and innovation sector into the future. Our commitment to fund the program for a further three years is the next important step to building a stable sustainable Fellowship scheme.

Previous Future Fellowships have contributed significant productivity gains for Australia and have attracted world class researchers to work in our labs. The Greens believe the Future Fellowships program should be cemented into the Australian research fabric to allow our mid-career researchers the flexibility and opportunity to excel at home.

**OPEN ACCESS PUBLISHING**

The Greens will commit over $40 million per annum to drive the development of a national program of open access publishing.

Over $7 billion worth of research in Australia each year is paid for by taxpayers through government-funded grants. The results of this research are published in peer-reviewed papers in scientific journals that are often hidden behind pay-walls. The Greens believe the results of publicly funded research should be widely available so that the maximum benefit can be gained from the knowledge created.

There are clear moves towards open access publishing both in Australia and internationally. From January 2013 the Australian Research Council has required that any publications arising from an ARC supported research project must be deposited into an open access institutional repository within 12 months of publication; the National Health and Medical Research Council has a similar policy. These moves mirror trends with other international research funding agencies such as the US National Institutes of Health, the Wellcome Trust and the UK Medical Research Council.

The Greens will commit $138.5 million over the forward estimates to drive the development and implementation of a national program of open access publishing. We will work with major academic institutions, research bodies and publishing houses to make additional funding available to cover the fees associated with publication of research arising from an ARC or NHMRC supported project. This will help ensure that publicly funded research is freely available to researchers, business and the wider community.

By pursuing a broad policy of open access to publicly funded research, we can better capture the true benefits of Australia’s significant investment, and build a solid foundation for an innovation economy into the future.
SUPPORT FOR RESEARCH COMMERCIALISATION

The Greens will commit $30 million to a Matching Development Grant Scheme over forward estimates, and commit to implementing the McKeon Review recommendation for a Translational Biotech Fund.

The 2013 McKeon Review reported obstacles to taking health and medical research innovation from breakthrough to commercial success. One of the major reasons Australia lags in research commercialisation is the lack of government funding to support translation of research into commercial products.

In the health and medical research commercialisation process, funding is required at three key stages—preclinical, early clinical and late clinical. Funding shortfalls during the first two stages have such a negative impact they are colloquially known as the twin ‘valleys of death’. Targeted government support at these two points that leverages matching support from private sources is critically needed.

Matching Development Grant Scheme

The Greens will commit $30 million to a Matching Development Grant Scheme. This commercialisation pathway will provide $500,000 per annum to consistently successful NHMRC grant recipient organisations, contingent on them matching the commitment. This four year funding stream will allow promising projects to bridge the gap between discovery and development to attract third party investment.

The development grants would go to organisations known to the NHMRC as proven performers in translating basic research into clinical and public health outcomes. It would require the recipients to match the funding dollar for dollar, select their own promising projects, demonstrate existing commercialisation experience and deliver rigorous administrative oversight. This scheme will maximise commercialisation opportunities, while effectively leveraging private investment.

Translational Biotech Fund

Early Clinical Support

The performance of biotech funds in Australia has not always been sufficient to attract ongoing private interest without further government investment. There is a real opportunity for government to deliver a strategic mechanism that will stimulate further private investment.

The Greens will commit government to funding half of a Translational Biotech Fund, with the other half to be funded on a matching basis by the private sector, such as large superannuation funds. As outlined in the McKeon Review (recommendation 16 C), the Translational Biotech Fund will target investments in projects in the early stages of clinical trials of novel drugs or medical devices. Investment during the early stages of commercialisation is critical to ensure translation of Australia’s health and medical discoveries into practical community benefits.

The Federal Government already has experience of similar programs such as the Innovation Investment Fund, and the Translational Biotech Fund would be run along similar lines, managed by a well-qualified external manager with experience in biosciences in Australia, and possibly in collaboration with off-shore venture capital. The Fund would make an average investment of $10 million per project in up to 25 Australian projects over the life of the investment. This investment would significantly improve the successful commercialisation of Australian biotechnology.
**FUNDING INDIRECT COSTS FOR MEDICAL RESEARCH**

The Greens will commit $141 million to phase in ‘indirect cost’ funding reforms

The research infrastructure funding landscape can be complex. When researchers at universities, research institutes and hospitals receive external grants from providers such as the NHMRC and ARC, the funding usually only covers the direct research costs but does not cover indirect costs. These indirect costs include things like rent, electricity, heating, facilities management, administration, HR and can amount to as much as 60% of any direct research dollar.

Funding for indirect costs may be covered by various auxiliary schemes but these apply to only some researchers in some circumstances some of the time. There is a fundamental difficulty in research funding system where direct research costs are paid by one agency and the indirect costs are paid for by another agency. It is time these complexities were removed from research funding and grants were rationalised.

The Greens will commit $141 million to begin phasing in funding reforms that will progressively address the gap between direct and indirect funding for Health and Medical Research in Australia.

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**ESTABLISH INTEGRATED HEALTH RESEARCH CENTRES**

The Greens will commit $120 million to fund four new IHRCs

The last decade has seen a major shift towards collaborative research, especially in health. Innovation is more likely to occur in a research cluster, where a network of complementary participants drives a faster flow of ideas. Research clusters support multidisciplinary team building, attract high-calibre researchers, and facilitate rapid multilateral exchange of information.

A similar integration of healthcare and research leads to better health outcomes. In the US, the top 16 hospitals all contain academic health research capacity; in fact John Hopkins research hospital is so successful it is the third most cited institution in the world.

There are currently few health research collaboration centres of this type in Australia and the Greens understand that we need an injection of strategic research infrastructure that will help drive collaboration, increase productivity and improve health outcomes for the community.

The Greens will establish four new IHRCs, funding each with $10 million a year for three years. This is the minimum number of IHRCs recommended by the 2013 McKeon review, a program the Greens will consider expanding in coming years if it proves to be successful.

The Integrated Health Research Centres will be new, innovative and flexible bodies that bring together many players in different ways. We anticipate that they will attract the best groups from universities and institutes, hospitals, industry, CRCs and the CSIRO. Using a hub and spoke model, these IHRCs will facilitate innovation and advancement in health service delivery, by translating health research into practical day to day health care.

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**REFERENCES**

1. 2013 Australian Academy of Science, Pre-budget Submission to Treasury, p.3
2. 2012 National Research Investment Plan, DIISRTE, p.20
3. Speech given by Ian Chubb, Australia’s Chief Scientist May 6, 2013
7. Women in Science in Australia Report, Sharon Bell 2009 p.16
8. Women in Science in Australia Report, Sharon Bell 2009 p.20