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**Submission to The Senate Economic Reference Committee inquiry into
Australia's Innovation System (The challenges to Australian industries and
jobs posed by increasing global competition in innovation, science,
engineering, research and education.)**

Across the globe developed and developing nations alike are looking for the new skills and capabilities that populations need to create new jobs and prosperity.

Australians understand that if we are to have a strong future as a nation we must be able to create and use knowledge generated through research - conducted here in Australia - in partnership with the best from the rest of the world.

We need to promote a culture of innovation within our industries large and small for them to be internationally competitive and for our economy to remain strong. We need a pervasive system of public and private research and innovation.

What we achieve through science, technology and innovation will determine whether Australia succeeds or fails in the 21st century.

And we cannot succeed if we persist with a stop-start, badly coordinated approach to research and innovation.

Scientific and other research helps us ride out storms of economic uncertainty and tackle the big challenges facing the nation, our region and the world.

Australia currently invests around 2.2 per cent of our GDP in science and research, putting us near the middle of the OECD table. Australia should be in the top half of the OECD table, and has more than enough research talent to justify such an investment. As an advanced, modern nation we deserve to be up there with the best.

But whatever sum the Federal Government invests in science and research, it must take a strategic, consistent approach, driven by a long-term vision for Australia.

The stop/start nature of funding in recent years means we are sliding backwards and will continue to do so unless action is taken.

Government investment that has a short-term focus can jeopardise critical projects and runs the risk of having very costly research infrastructure underused. Uncertainty leaves the nation's top researchers and innovative industries unable to plan and get on with the job of tackling our biggest challenges and grasping the greatest opportunities.

The Business Council of Australia and the Chief Scientist for Australia have both called for a long-term strategy for Science Technology Engineering and Maths (STEM), and the science and technology community have rallied behind that call.

Australia is one of only three nations out of 33 OECD nations without a STEM strategy.

Scientific innovation doesn't happen overnight. The really big discoveries like penicillin or Wi-Fi technology often take decades or more. Stable and consistent support for cutting-edge Australian work is critical if we are to match it with our competitors. Multinational companies dominate Australia's largest industries. Their investments in research and innovation are located where the economic circumstances are stable and most supportive of research and innovation. For them to continue to invest in innovation development in Australia, predictable government support for public and private research is necessary.

Across the globe other nations are moving to adapt to the times.

In the United States jobs in science technology, engineering and maths (STEM) are growing at three times the rate of others. The Americans are training another 100,000 STEM teachers, and educating another million STEM university graduates over the next ten years.

A US Government report estimates that advances in science and technology have created half of all US economic growth in the past 50 years.

The OECD reports that new sources of global growth are outstripping the old. Innovation activities - science, research and development - are responsible for as much 85 per cent of economic growth.

It seems virtually everyone except Australia knows that the future lies in a highly educated, STEM-literate workforce.

We are blessed with a good supply of natural talent. Why don't we promote that talent to the full, just as we do in the swimming pool and sporting field?

The seven fundamental principles listed below will boost competitiveness and build a stronger and more resilient nation. They should be part of any comprehensive policy approach.

Seven guiding principles to secure competitiveness and resilience

Investing strategically and sustainably

Governments must support planned, stable and appropriate investment in research over the long term, which is essential if we are to tackle large, complex problems and opportunities facing Australia. This will yield better results and ensure the best use of every dollar spent.

Building our research workforce – getting and keeping the best

To ensure we attract and retain the best researchers we must offer appropriate conditions. Many of the nation's world-class researchers are stuck in a cycle of one- to three-year grants for their salaries and research materials. This career uncertainty means many leave research or leave Australia to seek a stable future. The nation is the loser every time uncertainty impedes discovery, prevents planning and inhibits fruitful partnerships. Business has been vocal about critical skills shortages in Australia in science and engineering but little has changed in the development of our STEM workforce.

Building a productive system and getting the most out of it

Governments must set a stable and sustainable funding framework for infrastructure (buildings, equipment and the technical experts to keep them operating) especially for national facilities without which critical work cannot continue or even begin. This must be backed with resources that keep valuable facilities running once they are built. A central research infrastructure investment framework, such as National Research Investment Plan (NRIP), is essential.

Being among and working with the world's best

Global collaboration is more necessary than ever with the rise of international research, commerce, communication and other systems that transform our lives and opportunities. Our best researchers must be able to work with the best globally, building on the credibility Australian researchers enjoy across a wide array of disciplines. This requires strategic investment that facilitates international engagement at a government-to-government level, as well as support for collaboration on specific research projects.

Bringing industry and academia together

When industry and researchers work together effectively we innovate and multiply our strengths. We must ensure there are clear and reliable policy incentives that facilitate deep and sustained collaboration between industry, public sector, university and research institutes. This not only ensures that the benefits from basic research are translated into practice in Australia, but also harnesses national talent and creates knowledge, opportunity and new jobs.

Expanding industry research

Governments need to create an environment which encourages industry to invest more in research and which makes Australia an attractive place for international companies to undertake research. Improving industrial productivity has become critical to ensuring strong growth and innovation underpinned by research and development and investment plays a key part in meeting this objective. This must account for the unique industrial mix that underpins the Australian economy, with its dominance of primary/resource, services and tourism industries, not an attempt at transferring models from other countries that have different industrial bases. We need to support industry research that will aid our industries.

Investing in our best research and our best researchers

Government has a clear role in setting broad priorities for research, and in supporting research, which underpins discovery. The independent expert assessment process should be used to identify excellence and to coordinate the best researchers, research programs and groups. Australia's global competitiveness relies on us nurturing and rewarding our best researchers and research teams.

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