



# PRIME MINISTER

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SPEECH BY THE PRIME MINISTER  
OECD SCIENCE CONFERENCE  
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Distinguished Guests, Ladies and Gentlemen

On behalf of the Australian Government I extend a warm welcome to all of the participants in this conference and, in particular, to the many distinguished visitors from overseas. Nothing could be more fitting than that the first major OECD conference to be held in this country should be on "Policies and Directions for Science and Research".

Australian industries, academic institutions and governments in recent years have united on the urgency of increased and more productive effort in science and technology research and development. Just a few weeks ago I opened an important conference convened by major companies and the vice-chancellors of our universities focusing on precisely this critical issue.

In many ways few countries are more directly and acutely aware of the need to meet this challenge. We live, after all, in the Asia-Pacific basin, the fastest developing economic region in the world. On our doorstep are many of the countries which have most impressively harnessed science and technology in the service of economic growth and development.

If this were not sufficient incentive we have in Barry Jones, our Minister for Science, a passionate and energetic advocate of the importance of science and research for this nation's future. A recognised authority in his own right on this topic, I thank Barry for opening this conference this morning.

When I referred to the broad coalition of commitment that exists in Australia on this issue I was speaking from personal experience. One of this Government's early acts was to convene a conference on technology. From the very start we have included discussion of, and action on, the role of science and technology in our plans to revitalise Australia's economic performance.

Clearly, we are in step with our fellow OECD members in the significance we attach to this issue, as it was at the 1982 heads of State meeting in Versailles that science and technology was first placed on the agenda.

I understand this conference will contribute to the proposed OECD Ministerial level meeting of the Committee for Scientific and Technological Policy next year. As joint sponsor, Australia is proud to be facilitating attempts by OECD Governments to enhance the role that science and technology can play in encouraging economic advancement.

I would now like to take a little time outlining the role of science and research in Australia's economy and the measures the Government is taking to encourage greater effort in these areas.

Australia has traditionally relied for its standard of living on a rich endowment of natural resources. From this base we have developed internationally competitive and highly successful agricultural, mining and energy based industries. Importantly, the development of these industries has relied on science and technology.

Agriculture, for example, benefited from the early improvements in shipping transport and refrigeration technology which gave Australia access to rapidly growing world markets. Equally importantly the efficiency of our agriculture relied, and still does, on a high quality science and research base. Appropriately that base has been provided largely in the public sector but has been closely attuned to user requirements.

More recently the Government has moved on several fronts to improve the resources available for rural research and development. Technological innovation is an essential element in maintaining and improving international competitiveness in rural industries. Our commodity exporters, in general, have had to be highly innovative to remain competitive in the world markets in which they have predominantly operated.

But this traditional reliance on commodity exports has left us vulnerable and exposed to the recent major slump in the international prices of primary commodities. In the face of depressed mineral commodity markets and heavily distorting agricultural trading practices of the EEC and the US, we cannot expect a substantial turnaround in our terms of trade in the near future. Australia can now starkly see the need to restructure our economy with particular emphasis on

diversifying our export portfolio into manufacturing and services. Of course science and technology will play a leading role in this restructuring.

At a time when manufactures and services have led the growth in world trade Australia has not been part of that development. As a result our share in world trade has fallen sharply, from 12th world ranking in 1973 to 23rd by 1983.

These results have forced the increasing acceptance here that manufacturing must become more outward looking. I am pleased to say from first hand experience that there is increasing evidence that industry is alive to the possibilities now open to Australia. Last week I opened an exciting building program for a local pharmaceutical company that is aiming to sell 80 per cent of its products on international markets.

Plainly the most desirable new course for our manufacturers would be the one which applies science and technology most effectively to the production of innovative goods and services. Proving this point is the fact that the technology intensive products, headed by the electronics industry, computers and scientific equipment have been the fastest growing components of world trade in manufactures.

At present Australia devotes about one per cent of its GDP to research and development - a disappointingly low figure compared with the leading OECD countries. Not only large economies like the U.S. and Japan but also countries with more comparably sized economies such as Sweden and the Netherlands devote figures approaching around 3 per cent.

Much of our research effort is in basic research rather than market driven research undertaken by industry. More to the point, while the overall level of public sector investment in research and development has been broadly comparable with that in most OECD countries, expenditure by the private sector compares most unfavourably, especially in manufacturing. Averaging about 0.2 per cent of GDP it falls way behind the figure of 0.9 per cent for leading comparable medium sized OECD countries. Therefore it is no surprise that our industrial products have often lacked the competitive edge that comes from industrial research and development.

The substantial depreciation of the Australian dollar has boosted the price competitiveness of Australian industry. We must take advantage of this but we cannot rely on price alone as a basis for sustained competitiveness in the longer term.

There will always be countries with cost structures which we neither should nor could emulate. These countries will always be able to make many products more cheaply than we can, so our competitiveness must be bolstered by enhancing the non-price attributes of the goods and services we produce.

Innovation enhances competitiveness in areas such as product quality, lower rates of defects and better product performance. The key to the product and process development necessary for sustainable long term competitiveness therefore is innovation based on locally performed research and development.

Innovation requires firms to undertake research and development - particularly applied research and product development closely linked with opportunities in the market.

Having given you a brief and frank outline of the state of Australian industrial R&D, I would like now to outline the course this Government has mapped to get the best return for our country from our wealth of human resources.

Our strategy is, put simply, to provide incentives to increased private sector R&D activity while maintaining the overall level and improving the effectiveness of public sector investment in R&D.

Overseas studies of innovation policy show governments can act to complement the innovatory endeavours of technically progressive managers in industry by creating a national environment conducive to innovation. In the final analysis, however, these studies show that much depends upon the abilities of industrial managers.

Private sector R&D activity shares many of the characteristics of private sector investment generally. R&D expenditure tends to be undertaken by firms and industries in response to profit opportunities. Significantly in this context the Government has first and fundamentally restored the conditions for business profitability. By improving the overall investment climate we have improved the demand for innovation, including through industrial R&D.

We have also acted to provide direct incentives for innovation. These include a 150% tax concession for expenditure by the private sector on research and development, a complementary R&D grants scheme, a tax incentive for private sector venture capital investment as a complement to financial market deregulation, changes to government purchasing and offsets arrangements designed to give higher priority to technology and industrial development, and strengthening of support provided through Austrade for high technology exporters.

The tax incentive for R&D puts the decision on what R&D is to be conducted squarely in the hands of business. In this way it provides for the most effective linkage between market pull and technology push. Importantly, it provides a major incentive for the many foreign owned companies operating in Australia to locate more of their R&D activity here and to develop this country as a base for export activity.

It also provides an incentive for industry to establish closer links with public sector research particularly in the early years as industry scales up its own research capability. There are encouraging early signs of progress in all these respects.

So far nearly 1700 companies have registered for the tax incentive and report an overall increase of about 40% in real terms in their R&D expenditure in 1985/86, the first year of the scheme's operation.

In their recent report on Australia's Science and Technology policies the OECD Examiners favoured tax based incentives over grants as a means of stimulating R&D. At the same time the examiners noted that tax-based schemes do little to help small companies still struggling to become profitable.

The scheme of Grants for Industry Research and Development (GIRD) introduced as a complement to the tax scheme is directed at just such companies and particularly those which can demonstrate potential improved competitiveness and export earnings.

Another feature of the grants scheme is that it provides specific assistance for nominated technologies of fundamental importance to industrial competitiveness and with a widespread impact across many sectors of industry. Biotechnology is the first area to be identified in this scheme. Consideration is being given to further nominations such as new materials and microelectronics information technology.

The biotechnology scheme has established vital connections between scientists in public sector research organisations and companies which can commercialise a research achievement. A good example is the collaboration between CSIRO's Division of Tropical Animal Science and the company Biotechnology Australia. The project aims to develop a vaccine against cattle tick, based on synthesis of the tick's antigen by recombinant DNA procedures in micro-organisms.

Overall therefore, the Government has, and is continuing to, provide a major stimulus to private sector R&D activity. As I have indicated there are signs already that the private sector is responding. But we still have a way to go before we can be sure that we have attained the levels of innovative activity that can sustain long term competitiveness in world markets.

As business increasingly accepts the need for innovation, it will also become more aware of the substantial assets available to it in public sector research and of the need to draw on this resource to assist its own product development work. Of course this does not mean that the public sector should become directly involved in product development. But it does call for a wide variety of interactions between public and private research.

In Australia we already have underway a broad review of public sector investment in research and development. A principal concern in this review is to ensure that the substantial investment in public sector research contributes to our fundamental objective of enhancing innovation and competitiveness in industry.

Among the measures already taken as part of the review have been the setting of new directions for the Commonwealth Scientific and Industrial Research Organisation (CSIRO) - our major Government research organisation. The review of CSIRO was prompted, in part, by a growing perception that some sections of CSIRO were paying insufficient attention to the real needs of industry and the community. As a result of the review we have accepted a series of recommendations designed to change the general ethos of the organisation. In the future, the emphasis is to be on applications-oriented research and the strengthening of links at all levels between the organisation and the users of its research results.

The largest component of public sector involvement in research in Australia is in the higher education system. The Government will shortly be taking decisions on future directions in higher education research based on the ASTEC review which is nearing completion.

The challenge facing universities is to ensure that the most effective use is made of their funds. We have now seen a decade in which general or recurrent funding for universities research has remained about constant in real terms. During this period the growth in university research funds has come through more specialised funding schemes which are allocated competitively.

These include the National Energy Research Development and Demonstration Program, the Australian Biotechnology Scheme, the Marine Sciences and Technologies Grants Scheme, the program for promotion of excellence in research which has led to the establishment of special research centres, and the key centre for teaching and research.

These funds represent important supplements to the underlying levels of funding. But institutions have been slow to move towards more competitive internal funding arrangements which would allocate recurrent resources more selectively to the best and most productive researchers. In establishing suitable mechanisms university administrators could well look to practices in other OECD countries and to the practices of other major research performers in Australia.

Such developments do not, to my mind, impinge upon academic freedom. There is no basic conflict between excellence in research and the relevance of that research to national goals. The Government and the higher education institutions have a common purpose in seeking the best and most effective research from the funds which are available.

We do have encouraging evidence of closer links between university and industry.

I have mentioned the recent inaugural forum meeting between the chief executives of universities represented by the Australian Vice Chancellors' Committee (AVCC) and of business represented by the Business Council of Australia (BCA). Recent initiatives by the Minister for Education, including the establishment of an industry reference group, are designed to further facilitate this important interaction.

An example of a program funded by the Government to promote collaboration between industry and tertiary education institutions is the Teaching Company Scheme. Under the scheme a research project of industrial relevance conducted in a firm is jointly supervised by the firm and university. The scheme is valuable for technology transfer and in particular for allowing industry to tap the skills of highly specialised personnel in ways which would not otherwise have been possible. It is expected that one hundred such projects will be funded next year.

Obviously the Government believes there is a strong case for a level of public funding of research and development in Australia which is at least comparable to that of the better performing medium-sized OECD countries.

Because of the introduction of the tax concession and the need for continuing budget restraint, it is unrealistic to expect major additional funds to be allocated to public sector research organisations. The challenge for publicly funded institutions is to use the resources already available to them in as flexible a manner as possible.

Necessarily I have dealt largely with the economic implications of the policies and directions for science and research. But that should not be taken as the only measure of the esteem Australians have for individual skills and prestige of our scientific community. The manifest commitment to excellence shines through in so much of the work that is undertaken in their probing of the frontiers of human knowledge and experience. Australians have shown the ability to undertake research and development initiatives equal to any in the world.

Of course there is an international as well as a domestic dimension to our interests in science. Australia has a long and proud tradition of international co-operation in scientific endeavours. Australia was, to take one topical example, a founding member of the United Nations Committee on the Peaceful Uses of Outer Space.

Those involved in scientific research have a special responsibility and capacity to contribute to peace and security. In the Australian context, science and research have a particularly important contribution to make in

enhancing our capacity for defence self-reliance and in facilitating the conditions necessary for effective arms control.

Australia's size, small population and physical environment create special challenges and opportunities for defence science and research, particularly in the areas of surveillance communications and integration of weapons systems. These challenges are being met by Australians and particularly by the Defence Science and Technology Organisation (DSTO). The indigenous development of the technologies associated with the over-the-horizon radar, sensor equipment, anti-submarine warfare, electronic warfare, and command, control and communications systems have all played an important role in addressing the challenges posed by Australia's geographic and strategic circumstances.

Through this kind of research as well as through the integration of weapons systems appropriate to Australia's circumstances, science and research are making an important contribution to the maintenance of an effective Australian Defence Force and thereby enhancing our national security as well as the prospects for peace and stability in our region.

Scientific research can also actively promote peace through its contribution to effective arms control and disarmament measures. Two cases have particular relevance to Australia. Seismological monitoring is important in the detection of nuclear explosions and a major component of a verification system for any comprehensive nuclear test ban, which Australia is actively promoting, will be an adequate seismographic network. With the opening of the Australian Seismographic Centre in Canberra in September this year, Australia is uniquely placed to make an important contribution in this area.

Scientific research expertise can also contribute to international efforts aimed at eliminating chemical and biological weapons. Through our diplomatic activity and the expertise of the DSTO, Australia has been a leader in this area and has contributed to United Nations initiatives to control and eliminate such weapons.

These examples serve to illustrate a more fundamental point.

It is a tragedy that man devotes immeasurably more resources to scientific research for his own destruction than to work directed to the betterment of the human condition.

As the world anxiously watches the current efforts of the superpowers to move towards arms control agreements, we may reflect on the appalling waste of money and ingenuity which has gone into the build-up of their nuclear arsenals.

A conference such as this provides a rare opportunity for men and women of the scientific community to search for opportunities to reduce this shocking imbalance for the benefit of all mankind.



Many of these issues I have mentioned are on the agenda for your conference. This suggests that OECD governments are confronting common problems as they attempt to develop policies and directions for science and research. We welcome the opportunity to benefit from the combined experience of the distinguished delegates gathered here from many OECD countries.

I wish you well in your deliberations.

Thank you.

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