



Department of the Premier and Cabinet
Government of Western Australia

R+D Inquiry
Submission No.63.....

GARY NAIRN
MEMBER FOR EDEN-MONARO
10 SEP 2002

Our Ref: 200210796 Premiers

Mr Gary Nairn, MP
Chair
House of Representatives Standing Committee on Science and Innovation
c/- Inquiry Secretary
RI Suite 116
Parliament House
CANBERRA ACT 2600

Dear Mr Nairn

INQUIRY INTO BUSINESS COMMITMENT TO R&D IN AUSTRALIA

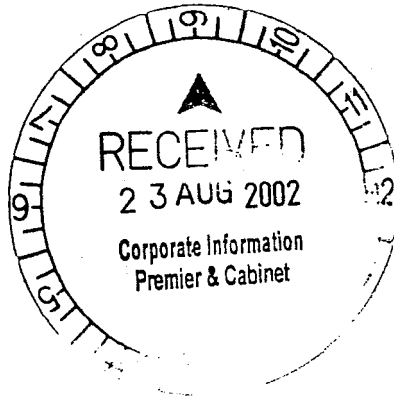
Thank you for your letter of 11 July 2002 to the Premier of Western Australia inviting a State submission to the above inquiry. I am responding on his behalf.

All relevant portfolios have been canvassed, and comments have been received from State Development; Health; Agriculture, Forestry and Fisheries; and the Office of Science and Innovation in the Department of Premier and Cabinet.

In general terms, the comments:

- refer the inquiry to the substantial body of work already conducted nationally and internationally on this issue, particularly in the area of medical and health research development;
- counsel against too much focus on competition for R&D funding incentives with the potential to lead to fragmentation of effort in WA, and to work against encouraging and fostering synergies and collaboration;
- point to the implications for governments associated with focussing business and industry incentives on the applied end of the R&D spectrum at the expense of the basic/pure science end;
- urge that incentives for business investment in R&D in emerging areas such as biotechnology and infomatics not be to the detriment of the need for ongoing research in the minerals and resources sector;

P Judge FA.



From the office of **BOB KUCERA** APM MLA

MINISTER FOR HEALTH

10th Floor, Dumas House
2 Havelock Street
West Perth WA 6005

Ph: (08) 9213 7000 Fax: (08) 9213 7001
Email: bob-kucera@dpc.wa.gov.au

Our Ref: 13640
Your Ref: 200210796 Premiers

MS LYN GENONI
A/DIRECTOR
FEDERAL, CONSTITUTIONAL AND TERRITORIES AFFAIRS
DEPARTMENT OF THE PREMIER AND CABINET



INVITATION TO MAKE A SUBMISSION TO INQUIRY INTO BUSINESS COMMITMENT TO R&D IN AUSTRALIA


Thank you for your memorandum of 29 July 2002 concerning an invitation to make a submission to the inquiry by the House of Representatives Standing Committee on Science and Innovation into business commitment to research and development in Australia.

As far as medical and health research is concerned, the Commonwealth Government commissioned the Health and Medical Research Strategic Review (chaired by Peter Wills), in March 1998 to examine the future role of health and medical research in Australia to the year 2010. The Committee's Final Report, "The Virtuous Cycle: Working Together for Health and Medical Research" was published in May 1999.

The Wills Review saw the need to develop a 'virtuous cycle' of government, research and industry interaction to improve the level and quality of medical and health research in Australia. As part of this, the Review addressed issues that would be directly relevant to all three questions that the current inquiry is seeking to address. For example, the Wills Review pointed to venture capital and taxation issues such as those relating to the capital gains tax regime and structuring of depreciation arrangements, as well as issues to do with technology transfer and management skills required for the associated new research based industries. Many of the issues were also considered from an international perspective. It then proposed a series of recommendations that would encourage greater involvement by private industry in this field in Australia.

In light of this work, I would propose in the first instance that the current inquiry be advised of this substantial body of work conducted at the national level for medical and health research. It may be appropriate, too, for the State Government to reserve the opportunity to make further comments, at a later point, on specific issues or proposals that the current inquiry may raise.

I trust that this will assist you in formulating the medical and health research component of the State response to this inquiry.



**Bob Kucera APM MLA
MINISTER FOR HEALTH**

22 AUG 2002

INQUIRY INTO BUSINESS COMMITMENT TO RESEARCH AND DEVELOPMENT (R&D) IN AUSTRALIA

- A WA RESOURCES SECTOR PERSPECTIVE

THE WA RESOURCES SECTOR OVERVIEW

The minerals and energy sector is a major contributor to the Australian economy. Within WA alone, Department of Mineral and Petroleum Resources statistics show that the sector employs approximately 42,000 people, with indirect employment of about 126,000 attributed to the sector.

There are some 300 different projects in operation in WA, producing about 50 different minerals. There are currently \$30 billion of projects in WA under construction or under serious consideration.

Sales for the WA minerals and energy sector in 2002 were valued at \$27.2 billion, with exports valued at \$22 billion.

R&D SPENDING

The resources sector is also a major contributor to Research and Development (R&D) spending. Figures released by the Australian Bureau of Statistics (ABS) in July 2002 in relation to the mining industry show that:

- There were 89 mining businesses conducting R&D in Australia in 2000/01, down from 103 in 1998/99.
- Australia wide, the mining industry alone spent \$456.2 million on R&D in 2000/01. Of this:
 - \$23.2 million was for basic research;
 - \$106.3 for applied research;
 - and \$326.7 for experimental development.

In WA, the mining industry spent \$210 million on R&D in the same year, which represented 46 per cent of all mining R&D in Australia. This compared with Queensland (26 per cent) and NSW (12 per cent).

RESOURCES RESEARCH

Australia has a long history of over 100 years in R&D and innovation in mining and minerals processing.

Australian innovators and researchers have pioneered and improved developments in breakthrough mining technologies such as floatation processing, X-ray fluorescence assaying, rock wall and cable bolting, airborne geophysics, satellite imaging and safety improvements. Cable bolting alone has made possible new developments on open cut mining operations.

Resources sector research has lead the way in environmental studies and advances. The research done by Alcoa on 'die back' in WA hardwood forests is a notable example. The resources sector has an enviable, world's best record in mine safety. Many of the safety innovations developed in Australia are used worldwide.

Sir Bruce Watson, former Chairman of MIM Holdings, in his 1993 address to the Australian Academy of Technological Sciences and Engineering, notes that R&D within the mining industry is largely driven by:

- Falling grades of ore
- The need to overcome technical and processing problems
- The need for safer, more economical mining
- The cost of mining under Australian conditions.

He also noted that most innovation in the industry has been developed through close collaboration between the industry, universities and researchers. This often involves a multidisciplinary approach between, for example, engineers, metallurgists, chemists, geologists etc.

In WA with its vast and often inhospitable landscape, operating costs are high and access to land for exploration has become more difficult. Research and innovations have reduced costs, created efficiencies and lead to the discovery of a vast range of mineral, oil and gas deposits, as well as more efficient ways to reprocess previously mined materials.

Of particular significance in WA is the development of the Hls melt process. The research leading to the commercial development of this process was carried out at Kwinana between 1983 and 1998 at a cost of about \$200 million, meeting obligations under State Agreement Acts. As a consequence, a \$400 million commercial scale plant will now be constructed on land provided by the WA Government at Kwinana. The plant will process high phosphorous content iron ore fines into high quality pig iron, suitable for use in electric arc furnace steel mills.

This will be a world first for Australia and, as it will use previously unmarketable iron ore fines, it will considerably extend the life and value of the State's iron ore reserves. As a further benefit, the process has significant environmental advantages over the blast furnace iron-making process.

Figures advised by Hls melt to the Commonwealth's Invest Australia for their Strategic Investment Application show that, based on benefits to the year 2020 in 2001 prices, the new Hls melt plant will have an annual production of 820,000 tonnes of pig iron, valued at about \$200 million. As a result it was estimated that:

- Australia's GDP will increase by \$176 million;
- Revenue to the Commonwealth Government will increase by \$144 million;
- Around 800 jobs will be created; and
- Net international exports from WA will increase by \$160 million.

Research leading to new innovations and processes has kept WA at the forefront of minerals processing, and in more recent years, oil and gas processing. The efficiency of the sector has made the industry more profitable and more resilient to price fluctuations. Continued research in WA is therefore vital to maximise the economic contribution of the resources sector.

FOSTERING COLLABORATION IN WA RESEARCH INSTITUTIONS

As noted earlier, most innovation in the industry has been developed through close collaboration between industry, universities and researchers. The research capacity of universities and other research institutions, therefore, must be maximised in order to achieve the best outcomes for the future of the resources industry.

In WA there are five universities, three of which are involved in resources education and research. Further, there are seven Cooperative Research Centres (CRCs) and seven Centres of Excellence (COEs), all with a geoscience focus.

The present system creates competition between the universities, CRCs and COEs for funding (from the industry and government), students and curricula. While competition has its advantages, care is needed to ensure that it does not lead to fragmentation and duplication and that synergies and collaboration are encouraged and fostered.

The report by the WA Technology and Industry Advisory Council (TIAC), "The Organisation of Knowledge: Optimising the Role of Universities in a Western Australian 'Knowledge Hub' ", published in June 2002, concluded that by international comparisons the level of research taking place in WA universities is low and is primarily concentrated in the resources sector. WA universities are winning less than their proportional share of national competitive grants.

The report argues for the development of a 'WA Knowledge Hub'. WA has a unique opportunity, with the closure of resources education institutions in the US and Europe, to build on existing expertise and become a world leader in this field of education. As a 'knowledge hub' it could be a focal point for resources industry funding and attract students from all areas of the world.

With the increasing globalisation of the resources industry, companies will invest in world leading research and development in institutions that provide them with the 'critical mass' of researchers and facilities needed to develop new processes and innovations. If WA can build a resources 'knowledge hub' it would be well placed to attract overseas research funds and researchers, reversing the 'brain drain'.

In WA, the value of achieving this 'critical mass' has been recognised and the Government is currently establishing a Resources Institute. The aim of the Institute will be to influence universities to collaborate to share staff, curricula and equipment. Because of the small size of the WA knowledge-economy, this will not be achieved unless there are structural changes leading to greater economies of scale. The Resources Institute has the strong support of both the Chamber of Minerals and Energy (CME) and the Australian Petroleum Production and Exploration Association (APPEA).

As highlighted earlier with the Hismelt example, the Commonwealth directly benefits through increased taxes and revenue, from research and innovations that have led to a more productive, profitable WA resources sector. It is therefore in the interests of the Commonwealth to ensure that WA resources research remains strong and vibrant and in the forefront of world best practice.

In a letter dated 7 August 2002 to the Federal Minister for Science, the Executive Director of APPEA, Barry Jones, noted that while the emerging technologies such as biotechnology and informatics are reaching a new prominence in government thinking as areas of particular national research significance, economic reality dictates that funding of R&D in these areas should not be to the detriment of resources research. He further notes that the oil and gas industry alone, contributes \$6 billion a year in taxes to government.

The WA Government fully supports this view and urges the Commonwealth Government to put in place policies and initiatives that will further encourage collaboration between universities, research institutions and the resources industry and enhance resources research.

ENCOURAGING STUDENTS INTO THE SCIENCES

If the Government is committed to developing industry commitment to R&D, it must also ensure that the pool of researchers available in Australia is sufficient to cater for the needs of industry.

The decline in the number of students graduating in science, technology and engineering is well documented. In the previously mentioned TIAC report it was noted on pages ii and iii of the Summary that:

- There is a worrying trend in the declining pattern of student enrolments, particularly at postgraduate levels and in science and engineering.
- In some areas of postgraduate study, small numbers of students are isolated from colleagues and academic staff because of institutional boundaries, despite working on similar problems.

The Commonwealth Chief Scientist in his report 'The Chance to Change' published in November 2000, stated that:

- That the number of graduates in science, engineering and technology is not increasing as fast as the total number of graduates (p. 52)
- The relatively higher rate of HECS for science students may be a further disincentive to a career in science teaching (p.52)
- Many of Australia's brightest researchers are pursuing careers outside the country, especially in the US where there are more attractive research environments (p 53)
- Excellent teachers are the key to exciting and sustained interest in science in schools (p. 50).

Anecdotal evidence from resource industry associations suggests that school students are possibly dissuaded by teachers and parents from entering areas of study relevant to the resources sector because of perceptions and concerns about the industry's environmental record. This may in part be due to a lack of understanding of the sector by the teachers and parents themselves.

While the industry must play a big part in keeping the general community better informed, governments must also work within the educational system to encourage,

inform and change attitudes. Two excellent examples of how government can assist this process are:

1. In August 2002 the WA Government announced an initiative to reimburse the HECS fees of science students who take up teaching. The \$3.6 million initiative is aimed at building a science and technology base in WA schools; and
2. The WA Premier launched, as part of Science Week, two new prestigious awards to recognise excellence in science research. The awards are:
 - The Premier's Prize for achievement in Science (\$10,000); and
 - The Premier's Prize for Early Career Achievement in Science (\$5,000).

Initiatives such as these are essential if students are to choose the sciences as a career path and ultimately contribute to R&D provided by the private and public sectors. The Commonwealth must also develop initiatives that will ultimately boost the numbers of science graduates and researchers available, not only for the resources industry, but for Australian industry generally.

R&D TAXATION CONCESSION

R&D is an expensive process and often beyond the means of most businesses. As noted earlier, ABS figures published in July 2002 show that there were (only) 89 mining businesses conducting R&D in 2000/01.

The ABS figures show that mining R&D fell from \$537 million in 1997/98 to \$485 million in 1998/99 and \$291 million in 1999/2000. In 2000/01 it rose to \$456 million.

History has shown that the level of spending on R&D is very much tied to the level and complexity of the R&D Taxation Concession. It is understood that changes introduced several years ago to the legislation to overcome previous abuses, resulted in significant changes to the level of the concession, restrictions on claims and additional complexity which had a dramatic downward affect on private R&D expenditure.

Amendments to the legislation since then to increase concession levels to 125 per cent, and 175 per cent in some instances, have been welcomed by industry. The system is however still complex, with access, accounting and administration costs beyond the means of many small and medium businesses.

It is important that the Standing Committee examine and make recommendations on the Federal Government's R&D Taxation Concession provisions and determine the private sectors view of the effectiveness and accessibility of the system.

Your Ref: 200210796 Premiers
Our Ref: 8802 FM00886
Enquiries: Dr G Siemon
Phone: 08 9475 8810
Fax: 08 9475 8899

Ms Lyn Genoni
A/Director
Federal, Constitutional and Territories Affairs
Department of the Premier and Cabinet
197 St Georges Tce
PERTH WA 6000

Dear Ms Genoni

**INVITATION TO MAKE A SUBMISSION TO INQUIRY INTO BUSINESS
COMMITMENT TO R & D IN AUSTRALIA**

I refer to your letter of 29 July 2002 inviting comment on the above paper. Specific comments can be made in relation to the forestry and forest products industries, because this enquiry would affect forest growers, harvesters, timber processors and manufacturers.

What would be the economic benefit for Australia from a greater private sector investment in R & D?

Australia currently has a lower investment in R & D compared with GDP than most other OECD countries. Lack of investment by the private sector in comparison to Government investment is the major reason, although funding overall should be increased. As a general comment, it is essential to increase the capacity of Australia's manufacturing and high technology industries, and decrease the reliance on primary products for export markets with the vagaries of world market prices.

What are the impediments to business investment in R & D?

While there are currently taxation concessions for investment in R & D, the definitions of 'Research and Development' and 'Innovation' could be made more flexible. Expenditure relating to environmental issues is currently not given tax concessions, although complementary to commercial production. The cost of growing trees to reduce salinity effects can only be justified if there is some commercial return, and having to grow trees at large distances from markets is not economic.

As another example, assessing growth of plantation species, and through tree-breeding the improved families and individuals for use as forest products, should qualify as R & D. The subsequent assessment of the potential of plantation-grown

exotic species may use existing standard procedures, but this R & D could be regarded as innovative because a new resource is involved.

What steps need to be taken to better demonstrate to business the benefits of higher private sector investment in R & D?

The private sector should be encouraged to invest, whether as individual companies or part of a network. Two of the major factors are the need for more efficient production, and the opportunity to develop both domestic and export markets. A major disadvantage for the forestry and forest products industries is that with the long rotation crop the benefits of R & D are not realised or achieved for perhaps decades.

There is a need for better integration and collaboration between Government and the private sector to encourage these areas, because networking is essential to get economies of scale. In addition, the overall environmental and social benefits of forestry and forest products enterprises should be considered with the economic benefits.

Yours sincerely

Dr Paul Biggs
GENERAL MANAGER

26 August 2002

INQUIRY INTO BUSINESS COMMITMENT TO R & D IN AUSTRALIA

RESPONSE BY DEPARTMENT OF FISHERIES

The following points have been raised by the Department of Fisheries:

- In terms of private sector R&D, the Department seeks to support commercial operators in aquaculture, post-harvest and pearl production. The bulk of the fisheries-related R&D the Department undertakes is by its nature "Public Good" research which is appropriately undertaken by Government institutes and the universities.
- One suggestion on how the Federal Government could improve R&D expenditure in small business is the reintroduction of tax incentives such as the 150% deduction for R&D.
