



**AN INDUSTRIAL SCIENCE POLICY  
FOR WESTERN AUSTRALIA**

**Some Seed Ideas**



WESTERN AUSTRALIAN  
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## AN INDUSTRIAL SCIENCE POLICY FOR WESTERN AUSTRALIA

### - Some Seed Ideas -

The purpose of this paper is to advocate the preparation of a science and technology policy for Western Australia.

Across the whole of Australia, industries, academic institutions and governments are becoming increasingly aware of the national imperative of obtaining and maintaining a competitive edge in international markets. It has become powerfully clear that developing a competitive edge depends upon a high level of commitment to Research and Development. In terms of new industries and industrial growth, the most successful countries are increasing the quality and volume of their R & D in accordance with a carefully thought out policy.

The need for close collaboration between industry, academia and government for planned and forward progress is widely understood. Yet Australia has been slow to formulate a national science policy to guide the development of the mechanisms to stimulate the necessary co-operative efforts. Such a national science policy now exists.

This national policy highlights the need for a Western Australian Science Policy. Western Australia has different natural and human resources which together give it differing national advantages to many other States.

To make the most of the natural advantages, so as to enable Western Australian industries to hold a competitive edge, it will be necessary for there to be intensive co-operative effort in a few selected areas.

The purpose of advocating a Science Policy is to maximise the chances that the right areas are selected and that the various stakeholders are aware of the selected priorities and agree to direct their efforts towards them.

The process of developing such a policy is necessarily itself a co-operative process involving government, academia and industry. This paper does not pretend to be a draft policy.

Some seed ideas have been included to serve as discussion starters for the topic of a Science Policy for Western Australia.

Three areas are raised as seed ideas;

1. Education and Training;
2. State/Federal Partnerships;
3. Science and the Commercial Industrial sector.

Readers are encouraged to ask themselves, "What should be the key elements of a policy for W.A.?"

## EDUCATION AND TRAINING

The unprecedented rate of change in knowledge and skills being experienced world wide has important implications for current education practices and training programmes in Australia.

Recent studies confirm that there is a declining participation rate in science and technology disciplines at secondary and tertiary levels of education in Australia. The proportion of Year 12 students studying traditional secondary science subjects has steadily declined over the past 15 years.

This situation is mirrored at the tertiary level. Whereas total tertiary enrolments have almost doubled over the past decade, enrolments in the physical, chemical and geological sciences have remained essentially static. The same trend is evident in engineering.

A number of identifiable factors have contributed to the declining participation in science and technology:

- (a) a lack of emphasis by schools, employers and government on the importance of scientists and technologists to the continuing development of Australia;
- (b) the masculine image of science and technology which has inhibited female participation;
- (c) a shortage of suitably-qualified mathematics and science teachers.

Such trends have important implications for our scientific and technological future and will have a direct bearing upon our ability to compete with other countries.

**NOTE:** Over the last five years almost 50% of the successful applicants for graduate or corporate membership of the Australian Institute of Engineers have non-Australian qualifications.

There is an urgent need to encourage more students to enter those fields of study which can enable Australia to compete in an increasingly technological world, and to enhance our tertiary institutions as first rate establishments capable of attracting students of high ability to study science-based courses.

The effectiveness of science education and the links between schools, tertiary institutions and employer groups may be enhanced by:

- i) initiating a system of science awards for outstanding teachers and students;
- ii) extending the Neville Stanley Studentship scheme to the secondary school level;
- iii) developing a system of cadetships in science and engineering to attract able students into these professions;
- iv) developing financial incentives to attract students to undertake graduate studies in engineering and science, where the research is of direct relevance to an industrial company and where scholarships are jointly funded by industry and government;
- v) initiating a scheme of "Industrial Studentships" to enable students to undertake post-graduate training whilst continuing to work;
- vi) encouraging collaborative training programmes whereby university based project work can be carried out in companies;
- vii) conducting special Summer Schools for outstanding secondary school science students;

- viii) involving more scientists mathematicians and engineers in secondary education;
- ix) conducting special science talent quests, teacher in-service courses and providing specific support for science clubs throughout primary and secondary schools.

### STATE FEDERAL PARTNERSHIPS

1. At present there is a dearth of Commonwealth research grants at the applied end of the R & D spectrum. Government research funding agencies should provide more grants which combine private industry and government funds for work on industry related projects.
2. The National Teaching Company scheme should be extended to provide opportunities for a greater number of applied science and engineering students to work in innovative companies.
3. The Commonwealth funded "Centres of Excellence" established within tertiary institutions should be expanded.
4. The space requirements and equipment needs of science-based courses at universities should be addressed as a matter of urgent priority.
5. Currently the Commonwealth funded research organisations such as CSIRO, Defence Science Laboratories, The Australian Atomic Energy Commission, Telecom Research Laboratories, Bureau of Meteorology and the Bureau of Mineral Resources, are heavily concentrated on Australia's Eastern seaboard. Action is required by the State and Commonwealth governments to ensure that W.A. receives a fair share of the nation's scientific budget and an appropriate share of the nation's government funded research organisations.

## SCIENCE AND THE COMMERCIAL INDUSTRIAL SECTOR

In order to increase the quantity and quality of people entering science courses it is essential to overcome the shortage of vocational opportunities for scientists in Western Australia.

- a) The Government should examine ways of encouraging companies involved in advanced technology projects to provide relevant employment opportunities for scientists (very few scientists with research qualifications are employed in Australian industry).
  - b) The industry-university collaboration achieved through the Western Australian Mining and Petroleum Research Institute should be expanded to embrace other science and technology sectors.
2. A number of scientific services are essential to industry. Paramount amongst these are calibration, standardisation and testing services which undertake quality control and quality assurance programmes. Government should work with industry and the universities to improve the quality and breadth of scientific services available to W.A. industry.
  3. A government supported mechanism should be developed in W.A. to enable small companies to obtain technical advice and assistance in carrying out R & D as and when required.
  4. A system of public accountability for government funded R & D, whether in Research Institutes or in Government Laboratories, should be established.

Furthermore, in order to achieve economic advantage from the high level public sector research investment  
- the capacity to commercialise research and develop the intellectual property of government agencies will be encouraged.

5. Technology Exchange schemes involving entrepreneurs, graduates and industry which enable students to spend some of their training periods in industry (in many overseas universities) should be carefully examined with a view to the introduction of a similar scheme in W.A.

### CONCLUSION

To debate the above three issues closely may indicate a misunderstanding of the purposes of this paper. A more fitting response might be to consider the questions:

1. Is there a need for a Science Policy for Western Australia?
2. If so, which parties should be involved in its development?
3. What issues might the policy address?
4. How might the various stakeholders be encouraged to respond to the suggestions contained in such a policy?

If positive answers can be found to these questions, then the task of preparing a Science Policy for Western Australia could be recommended.