

# SCIENCE AND TECHNOLOGY POLICY

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## 1. PREAMBLE

1.1 Research and development are major investments which are a prerequisite to economic and industrial revitalisation in Australia. As such they should be encouraged across a wide spectrum in the natural and physical sciences and engineering. Australia also requires such activity in the social sciences and humanities to provide, for example, a deeper understanding of work organisation, job design, workplace culture and practices.

1.2 The overall emphasis of Research and Development in Australia should be to encourage commercial development in those areas where Australia has expertise or needs to develop it in order to take advantage of existing and emerging markets both here and overseas whilst also carrying out a range of fundamental research into longer term issues.

1.3 Congress emphasises the totally indispensable character of the human resource factor in the research, design, manufacture, maintenance, transfer and operation of any technology.

1.4 Recognition is given to the increasing role of technology including information technology throughout all sectors of the economy and the skills that underpin these developments. Access to education and training in mathematics, science and technology should therefore be greatly improved.

## 2. A RESEARCH AND TECHNICAL BASE FOR IMPORT REPLACEMENT AND EXPORT

2.1 The expansion and development of Australian industry will benefit from closer interaction with well-supported public institutions carrying out Research and Development.

2.2 The major past failure in Australia in the area of research and development has been the low level of expenditure from the private sector. This position has changed over recent years in response to the Labor Government's initiatives to provide taxation based incentives for the private sector to engage in research and development activity. However, whilst private sector performance has improved it still falls substantially short of expenditure levels in comparable overseas countries.

2.3 The private sector does not currently devote adequate resources to research and development in Australia. By OECD standards, Australia is an overall poor performer on research and development however the shortfall is primarily in the private sector. This shortfall in research and development must be redressed through increased private expenditure however in the short to medium term it also requires a maintenance and expansion of government funded research and development in tertiary institutions and major

public sector research institutes such as CSIRO.

2.4 The expansion and development of Australian industry will benefit from both the private sector and well supported public institutions carrying out research. Congress calls on the government to improve funding of major public sector agencies, particularly CSIRO, and to enable these agencies to continue to develop for the good of the Australian economy and Australian workers and their families.

2.5 Australia's established public sector scientific and technological Research and Development capacity provided by bodies such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australian Nuclear Science and Technology Organisation (ANSTO), Defence Science and Technology Organisation (DSTO), Telecom Australia, Australian Government Analytical Laboratories (AGAL), the National Health and Medical Research Council (NH&MRC), the Australian Institute of Marine Science (AIMS), the Bureau of Mineral Resources (MBR), the Bureau of Meteorology and the presently publicly-owned education institutions should be retained as wholly Government owned and adequately supported. These agencies should be given more encouragement to enter joint ventures with industry in appropriate areas.

2.6 Allocation of Research and Development funds from Government or industry collective sources and/or public organisations should be on a basis calculated to provide the maximum benefits to the national interest. The results of this Research and Development should be effectively commercialised in such a way that their full benefit to the public is realised as well as providing adequate returns to industry. This will be best achieved by:

(i) ensuring that the full commercial prospects and benefits arising from innovations are fully protected by patent where possible and their application explored and realised.

(ii) operating procedures which overcome obstacles to co-operation and build linkages between research workers and other workers in the industry.

(iii) research workers should be involved with a product/process through the stages of its development.

(iv) preference for Australian owned enterprises as the recipients of the technology transfer process.

(v) providing a legal and financial framework in relation to owners of intellectual property rights arising from Australian research, which:

encourages exclusive or predominantly Australian based exploitation, and prohibits the sale or transfer or acquisition of those rights in circumstances which are contrary to the national interests

2.7 Congress also believes that when foreign corporations undertake research and development in Australia it is in the national interest that they pay fully for the accumulated human capital investment represented by the Australian

research workers used and/or undertake to exploit the research results for the national benefit.

### 3. HUMAN RESOURCES IN RESEARCH, DESIGN AND TECHNICAL SKILLS

3.1 Australia already faces a shortage of skilled personnel in key areas of science and technology and a number of disincentives exist in the workplace which discourage the entry of people into these occupations. To overcome these Congress calls for:

(i) reconsideration of the graduate tax in regard to its replacement with industry-based support for research, education and training;

(ii) improved infrastructure and access in areas such as libraries, equipment and machine-shop facilities for research and learning;

(iii) post-graduate stipends to be maintained in real terms;

(iv) employment arrangements in Government research agencies be designed to promote skill development and long-term commitment to careers in research and development;

(v) portability of superannuation and leave provisions.

(vi) establishing appropriate wage relativities for research workers in line with wages paid to other workers with similar levels of education and training;

(vii) increased appropriations for Government research establishments and tertiary education to provide more employment now for younger engineers, scientists and technologists who will be required to replace the large and ageing group of researchers and teachers recruited in the 1960's expansion of CSIRO, universities and colleges;

(viii) Paid study leave for employees in both the public and private sectors to maintain and extend their skills especially in mathematics, science and technology.

(ix) strategies in education and training to improve the learning of mathematics, science and technology and to encourage more women into these areas.

### 4. TECHNOLOGY AND THE SKILLS THAT UNDERPIN ITS DEVELOPMENT

4.1 Computer assisted design and computer assisted manufacture are being increasingly used. Container tracking, inventory and ordering of materials, are increasingly computerised. In communications and throughout the service industries more reliance is being placed on the use of computers.

4.2 Underpinning the development of this technology and many other aspects of production is an understanding of mathematics. Access to education and training in mathematics, science and technology should be greatly increased through the following means:

(i) increased programs and articulation to improve access and equity in mathematics, science and technology and improve their performance;

(ii) additional bridging courses in all sectors of TAFE, universities and colleges;

(iii) additional resources so that all primary, secondary and tertiary students studying mathematics and/or computing have adequate access to calculators and computers;

(iv) the development of an Australian education software industry through education authority procurement policies;

(v) greater public awareness of mathematics, science and technology and their role in the workplace through better careers advice, Science and Technology centres, information services and media campaigns.

## 5. THE SPECTRUM OF RESEARCH AND DEVELOPMENT FOR ECONOMIC AND INDUSTRY REVITALISATION

5.1 Whilst targeting particular industries and projects for increased research and development Congress nonetheless recognises that we cannot predict adequately where new technologies will emerge. We need to have basic knowledge and a pool of talented people across the spectrum of science and technology.

5.2 In addition to initiatives in physical and natural sciences and engineering more research carried out in social sciences and humanities should be targeted to economic and industry development, in for example:

(i) greater understanding of workplace issues;

(ii) the cultivation of a productive culture;

(iii) a greater understanding of the languages, cultures and market distribution systems of our existing and potential trading partners.

5.3 Industry policy should be aimed at increasing private sector investment in Research and Development. However public sector effort should not be diminished but increased over time. Congress recognises the significant economic benefits derived from research conducted in Government research establishments and tertiary education institutions.

5.4 Public sector research is also necessary to preserve our natural heritage; our unique animals and plants, an extensive coastline, and a fragile ecology. In addition the Government must be responsible for Research and Development affecting the nation as a whole such as communication, defence and the health and welfare of the Australian people. Improved Government funding should be provided for long-term research in these fields within Government instrumentalities and the tertiary education sector.