Matching Science and Technology to Future Needs: 2010 - An Introduction

1994
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1 Executive Summary

This document outlines a major study to explore Australia’s needs for science and technology into the next century - focussing out to the year 2010.

The study is being undertaken by the Australian Science and Technology Council (ASTEC) whose role is to advise the Australian Government on important issues in science and technology.

This is the first attempt by ASTEC to take such a long-term perspective. The study has the potential to be of great benefit to our economic and social future and our capacity to maintain a healthy environment.

ASTEC invites interested parties with a stake in science and technology to become involved. This project cannot succeed without that cooperation.
2 Why study future needs?

What will Australia be like in 2010? Many features of society and the economy are changing rapidly, and science and technology will have a major role to play in our society of the 21st century.

It is widely recognised that technology, and the science and research that supports it, are vital contributors to Australia’s well-being and economic competitiveness. The most successful countries are those that have an innovative culture where knowledge and skills are developed and used creatively and effectively.

Australia will need to face many new challenges in the 21st century - growing environmental concerns, declining water quality, an aging population, changing employment patterns and our evolving role in Asia.

We need to understand the potential implications of developments in science and technology and maximise their benefits by closely and effectively matching them to emerging future needs.

It will be important to understand what science and technology can offer, as well as anticipate which areas of Australian life will need a greater contribution from science and technology.

We therefore need to have some idea about our future needs over the next 15 years, so that our investment in research and technology development has a better chance of contributing to the well-being of the nation.

3 What is the aim of the ASTEC study?

The aim of the study is to come to a better understanding of the forces shaping the long term future. Taking account of these forces in policy formulation, planning and decision making will allow us to better meet emerging needs and opportunities.

ASTEC considers that such a study would provide an integrated outlook by identifying and reviewing -

- possible national and global economic, political and social changes over the next 15 years.
- Australia’s future needs and opportunities that are influenced by the application of technology in particular sectors, and
- overseas methods to match science and technology to national objectives.

As the study progresses, and further information becomes available, ASTEC would work in conjunction with other interested groups to provide an assessment of -

- demand patterns and opportunities for science and technology, including emerging technologies and the needs of industry.
- likely developments in the structure and dynamics of the science and technology system,
- potential mismatches between supply and demand for science and technology in Australia, and
- the ability of Australian science and technology to adjust to changes.
In turn this may lead to suggestions of how to improve the responsiveness of Australian science and technology systems to emerging needs or opportunities.

The study does not aim to provide detailed forecasts of the future. It simply aims to provide the best analysis of possible future developments.

It is the process of considering future needs - rather than the final result of that process - which will be of most value.

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**Future Needs Foresighting Factors**

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4 What does ASTEC intend to do?

Based on a range of views about the social and economic changes in Australia over the next 15 years, ASTEC will form perceptions of what Australia will want its science and technology community to be doing. ASTEC will consult widely.

ASTEC will review the main directions in science and technology in Australia and internationally, and interpret how these could or should impact on Australia’s science and technology direction and efforts. It will compare this picture with what is happening now, and make judgments about what changes may be necessary.

These judgments and the information on which they are based will be made through broad consultations with the community and with specialised groups including research agencies, government and firms.

5 How does ASTEC intend to do it?

The study recognises and will build on, the pluralist nature of Australian science and technology. It is intended that the study involve all interested groups in a widely accessible and transparent process.

The proposed structure of ASTEC’S work has three main streams.

The first - the Overview - involves a broad approach to both supply and demand issues, with a wide consultation and review process. The second - Partnerships - allows other interested parties to collaborate with ASTEC on specific initiatives of interest and relevance.

The third - Independently Managed Studies - ensures the knowledge of other groups conducting their own future-oriented analysis and studies will be taken into account.

An outline of each of these streams follows.
5.1 ASTEC Overview

The Overview will be the initial focus of the Future Needs study. It will provide a contextual picture which identifies and broadly reviews:

- Australia's future needs and opportunities;
- possible national and global economic, political and social changes over the next 15 years; and
- overseas methods to match science and technology to national objectives.

The Overview aims to draw together information on what society's needs will be for science and technology in the year 2010 - compared with our likely science and technology capabilities - to see if we will be able to meet these needs and, further, whether Australia should be doing something about meeting those needs.

This will be achieved by drawing together existing information and new ideas. This will start with the release of a Background Report followed by a series of Issues Papers. These papers will be available for comment by all interested parties and will be followed up at Round Tables to be conducted early in 1995. The Round Tables will assist in synthesising the available knowledge and expertise into a report to Government.

The Overview process will provide a useful window on current thinking and developments in science and technology to 2010. More detailed analysis will be provided through the partnerships and independent studies.
5.2 Partnerships on Critical Studies

There is a need to test the relevance of future-oriented studies to the detailed analysis of key issues in 2010. It is equally important to have input from these studies in further developing the framework for analysing future needs.

It is proposed that a number of “partnerships” be developed between ASTEC and organisations or stakeholders in various fields of interest - economic, industrial, environmental and social. This will require commitment by areas of government, industry, the science and technology sector and the broader community.

Partnerships are designed to be mutually beneficial to both parties. For example, partners will benefit from ASTEC’s rapidly growing knowledge of future needs issues and methodologies which can be applied to their area of interest.

ASTEC will benefit from the opportunity to learn from the practical application of this knowledge to “real life” problems.

The development of collaborative studies and information gained is important in informing decision making processes by showing practical outcomes can be achieved through analysis of future needs. While these partnerships might be narrow in specific focus, areas to be investigated could be quite diverse to demonstrate the wide applicability of foresight processes.

However, not all future-oriented studies will be suitable for ASTEC partnerships.

Suitable partnerships will involve in-depth consultation with interest groups in the chosen area and may include, for example, the linking of information and expertise from many organisations such as industry, government and research organisations.

The outcomes will feed into the broader Overview process.

5.3 Independently Managed Studies

Independent studies are seen as vital contributors to the Overview process.

This stream recognises that there are many future-oriented studies already under way or planned in Australia. It is important to integrate that knowledge and experience into the ASTEC Future Needs study.

For example, the CSIRO has spent considerable effort developing priority setting processes and relevant information databases - much experience and knowledge has been gained and this could provide a valuable contribution to the broad ASTEC process.

The ASTEC study could also provide the vehicle for further dissemination of the results of such independent studies to a wider audience.

This component of the study would therefore promote a sharing of information, methods and results in order to enhance a wider understanding and appreciation of issues and to promote the involvement of a broad range of groups.
Future Needs Study Structure

ASTEC Managed Overview

Socio-economic issues and industry needs in the 21st century

Science & technology capacity to 2010

Independent Studies
Science & Technology future-oriented studies undertaken by independent organisations

Synthesis & Roundtables

Separate Partnership Reports

Report to Government

Further work
6 How will the study be managed?

There will be a three tier management structure to oversee the development of Future Needs - an ASTEC Committee, a Reference Group and specific purpose working parties.

The **ASTEC Committee** is the central element of the ASTEC's Future Needs management structure and will be strongly involved in investigations and reporting. It is a working committee, convened by Professor Ron Johnston. Other members are: Mr Donald Blesing; Dr Doreen Clark; Professor Don Nicklin and Dr Kerry Schott.

A **Reference Group** of eminent Australians will be established as the major advisory body and to provide additional perspectives. The Reference Group will be chaired by Dr Don Williams (the ASTEC Chair) and will include representatives of government, science agencies, industry, professional bodies, unions and community groups.

There will also be **Working Parties** responsible for major elements of the study. They will be active working groups and will be strongly involved in investigations and reporting. Working Parties, chaired by a member of the Council Committee, will involve experts from outside ASTEC.

ASTEC works closely with the Prime Minister’s Science and Engineering Council and the Coordination Committee on Science and Technology. For the Future Needs study to be useful to the Government and to meet the needs of other clients and major stakeholders, close links between ASTEC, and these other bodies are essential.
7 What will be the results?

A wide range of outcomes are anticipated. These include adding to knowledge about foresight; building commitment to the process of foresight; providing input to decision making for science and technology; and contributing to cultural change.

The study should also provide information and analysis for the Commonwealth Government in its various science and technology policy development activities.

The specific outputs in the first six months will collate and disseminate information from a wide range of sources on potential developments in science and technology and our broader society to 2010.

They will commence with the launch in August 1994 of “Future Needs - A Background Report” which will present issues and background to the ASTEC study and an overview of the process to be adopted. This will be followed by a number of reports over the following months, which will seek to:

- draw together in detail the findings from overseas foresighting experiences;
- provide an Australian focus for material about the global context and science and technology developments and capabilities; and
- review social developments and economic future ideas.

Outputs in the second part of the process will report on new work which has integrated science and technology capacities within broader socio-economic trends.

It is currently planned to present a report to the Commonwealth Government in mid-1995 on results and possible future work.
8 How can I be involved?

Individuals and groups can participate in this study within one of the three streams - the Overview, Partnerships or Independently Managed Studies.

A broad range of interest groups and individuals can take part in the Overview exercise:
- community groups may have views on what society will be like in 2010;
- industry or government businesses can point to potential market opportunities; and
- research bodies such as universities or independent researchers may wish to talk about science and technology developments over the next 15 years.

Major organisations in the public or private sector with an interest in exploring their specific areas of interest may wish to discuss the development of Partnerships with ASTEC.

Any groups which have previously done, are currently undertaking or have plans for future-oriented studies are encouraged to approach ASTEC to have their work included as an Independently Managed Study.
9 Who should I contact?

ASTEC will be publishing its first Overview report in August 1994 and this will be advertised nationally. If you would like to receive this document, or if your organisation would like further discussions, please contact:

Karl Brennan
ASTEC Secretariat
Department of Prime Minister and Cabinet
Canberra ACT 2600

Phone: (06) 2715084
Fax: (06) 2715125

10 A note about ASTEC

ASTEC was established as a statutory authority in 1979 under the Australian Science and Technology Council ACT 1978.

The Australian Science and Technology Council (ASTEC) provides independent advice to the Commonwealth Government on a wide range of policies and programs related to science and technology and concerning Commonwealth departments and agencies, higher education institutions and private enterprise.

It works closely with the Prime Minister’s Science and Engineering Council and other major bodies providing policy advice to the Government.

ASTEC is in a unique position to provide advice to the Government because of its independent status, its broad longer term perspective and its links to the science and technology community and to industry.

The Council currently has thirteen members broadly representing all areas of the science and technology community, many with strong industry links. The Council is chaired by Dr Don Williams AO, who is also Chairman of the Australian National Railways Commission.

ASTEC is empowered to operate by conducting inquiries, gathering information, engaging consultants, appointing committees and producing reports.