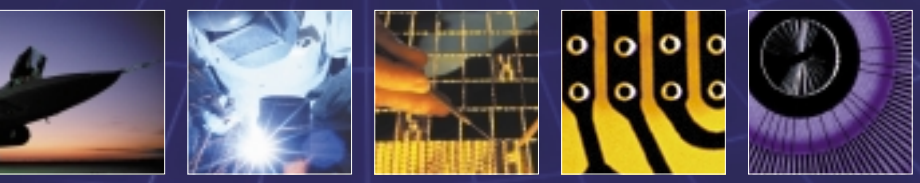

Emerging Technologies Working Group Report and Action Plan

September 2002

NATIONAL INDUSTRY SKILLS INITIATIVE

COMMONWEALTH DEPARTMENT OF EDUCATION SCIENCE & TRAINING

Emerging Technologies Working Group Report and Action Plan

September 2002

A joint project between the Department of Education Science and Training and the Australian Industry Group

The project was funded by the Commonwealth of Australia through the Department of Education, Science and Training

CONTENTS

Working Group Report
Preface

Emerging Technologies are stimulating processes and redefining products within our society and our industries. Of significant note is the need to convert Australia's exceptional intellectual ability in research and design into a significant return on this investment for both industry and the community. To fully achieve returns from emerging technology, Australia requires a skilled workforce supporting businesses making investments in technology and exploring new market opportunities from which they can make a significant contribution to the local and national economies.

If Australia's industry and community sectors are to reap the full benefits of emerging technologies, in relation to skill development, then Australia must achieve two objectives:

1. Establish new manufacturing industries, to produce the value added products for Australian consumers and export opportunities.
2. Support the integration of emerging technologies into existing manufacturing industries.

Those involved in the development and enhancement of skills, aligned to emerging technologies, must acknowledge that their underlying responsibility is to the Australian economy. Those industries leading Australia into the new frontiers offered by emerging technologies must establish a path for others to follow; otherwise there is a risk of isolation and constraints on growth.

A clear message from this project is the need for all parties to work together. Those involved in obtaining the financial backing for emerging technology development and infrastructure, and those developing Australia's youth must clearly identify needs, pathways and processes to ensure that developing industries and career expectations are aligned. It is essential to ensure that there is a nationally consistent whole of Government approach to the aligning of industry needs and career expectations, so that it does not become bureaucratic and fractured by conflicting priorities.

Australia cannot afford constraints on industry establishment and expansion due to shortages of skilled employees, and the National Industry Skills Initiative is a successful partnership of industry and government ensuring that existing and potential shortages are addressed.

The project would not have been possible without the substantial contributions made by individuals from enterprises developing, implementing and manufacturing products as a result of emerging technologies. In addition the members of the Management Committee and especially the Working Group have wrestled with the challenges and diverse opinions in order to prepare the final National Industry Skills Initiative Emerging Technologies Action Plan. I would like to take this opportunity to thank all those involved in the development of this plan for their contribution and passion.

There is now an opportunity to embrace the challenge, focus on the objectives and create a skills base in support of Emerging Technologies. Australian industry cannot afford to miss the opportunities Emerging Technologies create.

RN Herbert
Chief Executive,
Australian Industry Group
and Chairman of the Emerging Technologies Project

Working Group Report
Executive Summary

The Management Committee and Working Group of the National Industry Skills Initiative - Emerging Technologies Project, present their Report and Action Plan on skill needs for emerging technologies.

Because of the economic importance of emerging technologies to Australian industry and the opportunities for value-added Australian products for export, Australian Industry Group (Ai Group) and the Commonwealth considered that priority be given through the National Industry Skills Initiative to investigations in the area of "emerging technologies and skills development". Training and skills development is vital for the establishment and growth of industry, and where emerging technologies are concerned, it must be responsive and immediate if it is to meet the demands of industry.

The resultant project identified:

- the nature of research into these emerging technologies would be heavily influenced by the fact that there was no single identifiable industry sector.
- the influence of emerging technologies is across a wide range of industries and therefore, there was no comprehensive data set that could be analysed to identify trends.
- that emerging technologies have particular traits that require alternate thinking from those charged with the responsibility of setting the priorities and planning the responses for skills development; and
- it is important to appreciate that solutions need to be developed in the context of a need for flexible application across a range of industries.

To accommodate the nature of emerging technologies and their identified broad application across industries, the Working Group determined that the processes and strategies employed to identify the skills needs and appropriate responses required a different approach to those used to develop previous reports and Action Plans for the National Industry Skills Initiative.

The Action Plan details objectives and strategies, aimed at addressing the skills development issues associated with the implementation of emerging technologies into new and existing enterprises across a range of industry sectors. The scope of the project was limited to utilising the Photonics and Nanotechnology areas as the basis for research and industry interviews, however the Action Plan was charged with providing guidance on skills development for emerging technologies in general.

The Action Plan is in response to the concerns raised by industry and education providers in relation to skills needs for emerging technologies.

Concerns raised include:

- how can we train our existing workers when skills needs may not be adequately covered within existing teacher resources.
- what are the foundation skills present in or required for existing workers to embrace the acquisition of new technology based skill sets.
- how can we train when we cannot even adequately describe the emerging jobs associated with these new skill sets.
- the education system provides underpinning skills and knowledge for workers in a wide range of industries, emerging technologies require that workers are also able to adapt and respond to constantly changing technological environments.
- emerging technologies skill sets require a combination of technical, commercial and business skills that are difficult to access in the required combinations within existing Training Packages.

Introduction

Emerging technologies are interactive, they provide generic and specialised services to, and require underpinning knowledge and skills from, those working in industries as diverse as film, transport, education, medicine and music. Some technologies encompass 'new' activities and others enhance the processes of existing ones.

One of the common attributes of emerging technologies is the diversity associated with them. Those exhorting the benefits of their industry solution may find that at best they have an enterprise solution. This is not to say that enterprise solutions are not excellent in nature and delivering significant outcomes for the specific enterprises. A range of effective enterprise solutions may provide a significant base for identifying skills needs and developing appropriate training.

The key is to accept the concept that meeting the skills needs of applying emerging technologies to industry may encompass a host of divergent enterprise solutions. The education industry[1] will need to engage with enterprises that are initially not interested in developing a national or state wide skills curriculum. Enterprises in the main focus on utilising their knowledge to obtain a return on the investment in research and development via enterprise delivered commercial training courses. The challenge is to utilise individual enterprise knowledge and experience to deliver the cognitive aptitudes and employability skills to potential and existing employees to stimulate the next generation of research leaders and enterprise owners.

Stakeholders in education and training must also be prepared for the fluctuations resulting from operating in a global market/environment. They need to appreciate that emerging technologies, and the enterprises associated with them, are subjected to global forces that can reshape expansion and international product acceptance, thereby influencing the ability of, and or resources available within, these enterprises to support skills development partnerships.

The challenge is to provide a model where individual enterprises can engage quickly and efficiently with the training system when they have the need.

Emerging Technologies within industries have the potential to create expanding employment opportunities for appropriately skilled Australians as long as support mechanisms exist to develop these skills.

The development and adoption of emerging technologies by Australian industry creates both challenges and opportunities. As new technologies develop and evolve/mature into industries or are adopted by existing industries, they generate a need for a labour force possessing the cognitive aptitude and skill sets to adapt and utilise these technologies. Coupled with this general growth and development of technologies is individual enterprise growth leading to expanded demand for management positions aligned to manufacture and sales. What was uncovered is the need for a priority on diversification within the value adding, manufacturing industries based on emerging technologies.

Very early in the project it was identified that the processes and strategies employed to identify skills needs within emerging technologies could not be based on traditional methods of analysing data sets and employment/recruitment trends. The fact that emerging technologies are utilised across a broad range of industries meant that there was no single industry to base the analysis on. Consequently, the Working Group decided that an approach examining existing training options and current emerging technology user needs, be adopted.

Initially there was a perception that the skills needs of emerging technologies focused on the educational areas of maths and science. This perception was challenged by the responses obtained during the interviews. The weight of evidence gathered in the interviews highlighted the importance of communication and business skill development in conjunction with these traditional skill areas. Consequently the objectives and strategies identified in the Action Plan reflect the need to encompass a broader range of educational areas.

The Action Plan also seeks, within the existing National Training Framework, to develop innovative and targeted models that allow cross-sectoral training incorporating competencies drawn from current National Training Packages. It is anticipated that these models will encourage trainers and employers to fully utilise the customisation options available within the Framework, and address the need for targeted, immediate responses to industry's needs.

The interviews also demonstrated that where industries are using emerging technologies and meeting the challenges that these technologies bring to the workplace, there was a need not only to address the skills development of new entrants to the workforce but also the skills training for existing experienced workers facing the pressures of constant technological advances in equipment and products.

[1]The term Education Industry is used to encompass compulsory and post compulsory education and training options including tertiary education

An important issue clearly identified through the interviews was that new entrants to industries using emerging technologies may have considerable workforce experience and are not necessarily restricted to school leavers.

Methodology

Initial deliberations of the Working Group identified that the emerging technologies Initiative would require a different approach to identify skills needs because of the nature of the project in that a range of technologies were being looked at as opposed to a single identifiable industry.

It was agreed that the Methodology for this project should focus on a process, which included a desktop review of existing education and training options, interviews with CEOs of companies where emerging technologies are being used, and interviews with industry and research and development stakeholders.

Desktop research was used in conjunction with direct contact with educational institutions to identify existing training options. Specific details of this research were captured in the 2002 National Industry Skills Initiative Emerging Technologies Project, work in progress supporting documents, namely:

- Course Listing
- Background Reports and Reference Documents Register
- Internet Reference Register

Companies currently using emerging technologies were identified and approached to participate in the qualitative research phase of the project, along with research and development practitioners, in some cases associated with these companies and in other cases in stand-alone organisations.

The interviews were held between November 2001 and May 2002 utilising both site visits and telephone contact. The questions generated broad ranging discussions that provided valuable insights to company experiences in respect of existing training opportunities, availability of qualified staff, recruitment processes and expected future skill requirements.

The Interview Questions used were:

Question 1

As an employer, what value do you place on investing in training?

Question 2

What returns to your company do you expect to see from an investment in training?

Question 3

What skill sets and qualifications did you need to support the growth of your business to date?

Question 4

What skill sets and qualifications does your business need in today's business environment?

Question 5

What skill sets and qualifications are essential for the future of your industry?

Question 6

Were there any barriers to satisfying your needs as identified in questions 3 and 4?

Question 7

What recommendations, initiatives or solutions would you suggest for identified needs in the questions above? Please identify constructive solutions and consider short term (less than 12 months), medium term (12-48 months) and long term (more than 48 months). For example Government policies, course changes, training assistance schemes etc.

Working Group Report
Summary of Findings

A significant number of reports and papers aligned to emerging technologies focus on their application within specific industries and so refer to the development of "an industry". This project however, looked at the application of emerging technologies across industry and within individual enterprises.

From a skills development perspective, there was substantial identification of current and future skills needs, with estimates of job creation ranging up to 28,000 new positions by 2010. The significance of these reports lies not only in the quantity of information within them but also in their number. While many of the references are to "an industry", the issues identified may be relevant to a number of industry sectors.

A summary of these reports highlighted the following points for consideration:

- whether the new technology will be so revolutionary that it creates the need for a completely new paradigm and set of skills, or whether existing generic skills may simply be "contextualised".[2]
- skill requirements depend on the particular innovation, and may require only minor adjustments or radical initiatives to existing skill sets.[3]
- the establishment of a forum specifically tailored to the industry. The forum will be a mechanism for bringing together key stakeholders (government, business, community groups, educators), promoting and lobbying for the industry and updating the industry on policy and export issues.[4]
- the mutual benefits for vocational education and training, the Cooperative Research Centres and the industry generally from establishing and maintaining co-operative links.[5]
- the need for solid economic and workplace data when making decisions on resource allocation and training programs.[6]
- the role of emerging industries in Australia's future wealth creation and economic growth, and the part that skilled people will play in creating a competitive advantage.[7]
- Co-operative Research Centres and the vocational educational and training sector should be persuaded to actively seek partnership or participation in each other's organisations, making it easier for Co-operative Research Centres to negotiate in the vocational education and training system and ensuring that vocational education and training closely monitors industry development and emergence.[8]

The promotion of training and skills development for enterprises utilising emerging technologies was integral to all discussions and interviews conducted as part of this project. The Working Group, in developing the methodology, acknowledged that there might be diverse and certainly significant levels of 'non-traditional' concepts associated with skills development for emerging technologies. This proved to be correct.

Future strategies to support skills development in emerging technologies must be cognisant of the associated environment. The diversity of industries involved will lead to the development of enterprise solutions which, if taken together, may translate to industry wide solutions. The key is to ensure that the administration and financial support for the training framework encourages and nurtures customised enterprise solutions that allow the flexibility required to meet the needs of emerging technologies.

Significantly a strong theme within responses was the skills needs of evolving management teams. Initially research and innovation skills, underpinned by technical skills, are required; however, expansion into production, manufacturing and distribution requires skill sets aligned to finance and human resource management as well as the technical skills, reinforcing the need for flexible training options that encompass a range of skill sets. It is important to acknowledge that the acquisition of skills may be post initial and ongoing.

[2] CAN WE MEET THE SKILL NEEDS OF NEW INDUSTRIES:
Case Studies of Two 'Green' Industries
Monash University-ACER Centre for the Economics of Education and Training

[3] UP THE CREEK WITHOUT A PADDLE? NEW INDUSTRIES AND THE VET SYSTEM CEET

[4] CAPTURING EMERGING TECHNOLOGIES
Building Platforms for Australia's Future
Prepared for DISR by The Warren Centre for Advanced Engineering

[5] GOING BOLDLY INTO THE FUTURE –
A VET Journey into the National Innovation System
TAFENSW Industry Partnership Centre
Monash University-ACER Centre for the Economics of Education and Training
July 2001

[6] INFORMATION ON FUTURE JOBS AND SKILLS
Paper prepared for TAFE Frontiers
Monash ACER
Centre for the Economics of Education and Training
August 2001

[7] SKILLS NEEDS OF EMERGING INDUSTRIES
A Report of findings from a survey of Cooperative Research Centres to identify potential emerging industries and their associated workforce skills needs.
Prepared by the Emerging Industries Section. October 2000.

[8] VET AND THE NATIONAL INNOVATION SYSTEM
Paper for the 10th National VET Training Research Conference, July 2001

Working Group Report

Issues of Note

Co-operative Research Centres are making a significant contribution to the nurturing of creative research and the important conversion of research findings into commercial products. Cooperative Research Centres are also achieving significant outcomes with emerging technologies.
The Centres have been identified as a significant strategic investment that can encompass many objectives aligned to the creation of new Australian industries and products. Unfortunately outreach presentations to students, guidance counsellors, secondary teachers and vocational education and training staff by Cooperative Research Centres are limited in number. However, the Australian Photonics Cooperative Research Centre has an excellent record in this area and would make a worthwhile model for translation in a wider context. The Australian Technology Park in Sydney also sets a benchmark, not only in physical resources but also in relationships and partners.

In an exercise to explore education and training options the Working Group selected photonics and nanotechnology as examples of emerging technologies. The initial perception was that there were only a limited number of courses available to these fields. However, the research phase of this project identified ninety-one (91) Australian and forty-eight (48) international courses with a major focus on these technologies.

Together these two emerging technologies span the gamut of science and engineering specialties, making the task of documenting all related enabling courses impractical, indicating that the issues to be addressed are how to collate and simplify the listings of available courses and to investigate how to communicate these options to potential new entrants.

A reason for the initial perception of limited opportunities to study photonics and nanotechnology was the low response rate to inquiries to institutions for course information.
It must be noted that particular organisations and individuals were exceptional in their information and reply timeframes. However the response rate is, in itself a cause for concern. How do potential participants access timely course information?

As a result of the research a number of issues became evident, including:

- do emerging technologies have a training culture
- do the existing methods of skill development apply to emerging technologies
- what is the profile of the people and the skill sets in emerging technologies
- what are the familiar forms of education and training to the founders and managers of enterprises using emerging technologies
- will existing education and training products deliver the graduates in the numbers and timeframes required to support the take up of emerging technologies
- who will need the training
- how will the training be delivered
- in what way will these emerging technologies impact on the labour market
- how will potential course participants:
  a) find out about these technologies
  b) find out about the available options in the education and training arena

Proposed responses to these issues formed the basis of the Action Plan.

Some key points to consider in aiding the further development of skills for emerging technologies are:

- the need for public knowledge of the emerging technologies and their requirement for workers.
- that qualifications are available in both tertiary and vocational education and training sectors.
- that strong links between education sectors will help students understand the possible paths to future employment in the industries utilising these technologies.
- relevant skill sets may be acquired through re-skilling and/or upskilling.

A strong theme that emerged from the research is that there is an identified need for the establishment of strong links between government, educational institutions and enterprises so that funding is adequate and training initiatives are appropriate to meet not only current but also future skill needs.

An integral component of "manufacturing" success is the establishment and evolution of a multiskilled core of personnel supplemented by contracted specialist skilled workers. The core permanent personnel have the skills required to rapidly assimilate the contracted individual specialists into efficient production teams. As a company grows this core of permanent staff increases and the level of multiskilling also increases.

This concept identifies several key factors to manufacturing success for industries utilising emerging technologies:

- core permanent employees possessing individually high levels of technical knowledge, need to be multiskilled, effective communicators and possess strong team leadership (coaching and mentoring) skills;
- core permanent staff must be prepared to face change as the company grows and accept a range of work demands;
- the availability of a strong skilled labour force to meet production fluctuations;
- the need to access flexible customised training in response to multiskilling demands; and
- being able to access short specialised training courses as subsets of full qualification programs.

ACTION PLAN

Emerging Technologies
Executive Summary

The Project identified six key objectives supporting the development of a skilled workforce ready to accept the challenge of emerging technologies. The issue now is for key stakeholders to select relevant objectives, sponsor the strategies and implement these within the current skills training system.

Objective 1 Identify and endorse skills integral to the workforce to adapt to emerging technologies.

Addresses
The cross skilling and employability requirements for this workforce given the potential growth factors and the clear fluctuations in industry demands.

Objective 2 Acceptance and implementation of a cross sectoral training capacity.

Addresses
Concerns that the new skill sets require a combination of technical, commercial and business skills currently not available within a single National Training Package.

Objective 3 Strengthen and build strategic alliances across education and training, community and industry stakeholders to deliver pathways and outcomes.

Addresses
The need to increase the access students enrolled in compulsory and post compulsory education have to new technologies, researchers and innovation experts.

Objective 4 Develop a process and framework for the identification of skilled occupations and recruitment needs within industries utilising emerging technologies.

Addresses
The identification of specific skills within these technologies and the need to map skill development strategies against time cycles of industry/business growth.

Objective 5 Identify the opportunities and impediments related to the uptake of training in industries utilising emerging technologies.

Addresses
The need to ensure both human and capital resources essential to business growth and research are supported by, and not in competition with, training.

Objective 6 Review the extent to which existing mechanisms anticipate, forecast and address emerging technologies skills needs.

Addresses
The need to identify a process or mechanism to investigate current levels of emerging technologies course participation, anticipated/forecasted emerging skills requirements, timeliness of skill provision against industry need and financial and administrative issues of impact.

Emerging Technologies Action Plan

Objective 1:

Identify and endorse skills integral to the workforce to adapt to emerging technologies.

Addresses

The cross skilling and employability requirements for this workforce given the potential growth factors and the clear fluctuations in industry demands.

Aims to

Increase the employment options for Australian workers and develop an improved understanding and acceptance of the skills required within emerging technologies.

Outcomes Sought

A robust, skilled workforce comprising new entrants and existing/experienced workers to underpin the establishment and expansion of industries using emerging technologies.

ACTION PLAN STRATEGY

1.1 Identify and reference sources of information on competencies required within emerging technologies.

1.2 Promote the framework for Recognition of Prior Learning and existing competencies.

1.3 Conduct focus groups for key stakeholders to identify and endorse skills integral to emerging technologies and potential career paths.

1.4 Identify competencies by technology which reflect related working practices and skill combinations for inclusion in existing National Training Packages.

1.5 Achieve recognition and acceptance of contextualised, short, targeted skills training courses for emerging technologies.

1.6 Promote the inclusion of the Innovation Skills competencies in National Training Packages that are being developed or reviewed.

Objective 2:

Acceptance and implementation of a cross-sectoral training capacity.

Addresses

Concerns that the new skill sets require a combination of technical, commercial and business skills currently not available within a single National Training Package.

Aims to

Gain acceptance for a customised cross sectoral training approach, capable of responding to evolving skills needs associated with industries engaging with rapidly maturing emerging technologies.

Outcomes Sought

Recognition of the need for flexibility within education delivery systems and industry training arrangements.

National recognition and implementation of a cross-sectoral industry training framework to allow the delivery of innovative training programs aligned to the Australian Quality Training Framework.

Increased utilisation of the available customisation option within each existing National Training Package.

ACTION PLAN STRATEGY

2.1 Create strategic alliances of stakeholders to identify existing inflexibilities within delivery systems, map appropriate competencies in existing Training Packages and identify the prerequisites in underpinning knowledge required to operate effectively with emerging technologies.

2.2 Promote the need for an increased responsiveness by the formal training system to the immediacy of the skills needs of emerging technologies.

2.3 Encourage State and Territory Governments to develop funding and delivery models which support customised cross sectoral training.

2.4 Provide input to national training priorities promoting the need for the development and delivery of training within emerging technologies.

2.5 Establish a process for regular consultation between key stakeholders to ensure continued promotion of emerging technologies skills development.

2.6 Explore opportunities with ANTA to expand funding for "Centres of Excellence" to facilitate skills development in emerging technologies at a local level.

Objective 3:

Strengthen and build strategic alliances across education and training, community and industry stakeholders to deliver pathways and outcomes.

Addresses

The need to increase the access students enrolled in compulsory and post compulsory education have to new technologies, researchers and innovation experts.

The challenge of maintaining education and training course currency within a model acknowledging the importance of effective interpersonal communication, creativity, team building and flexible management skills.

Aims to

Encourage increased systemic communication, collaboration, moderation and innovation within and between the stakeholders.

Outcomes Sought

The identification of pathways that provide the opportunity for students to develop the technical skills within a culture that supports the attitudes necessary to equip them with the interpersonal skills for career and technology changes.

ACTION PLAN STRATEGY

3.1 Identify common goals of industry and education, and ways of working together to achieve these.

3.2 Establish guidelines for strategic alliances that:

a) Ensure participation by small/medium/large employers, all education sectors and the community.

d) Identify funding sources and ensure strategic alliance sustainability for a minimum of five years.

c) Support the involvement of regional stakeholders.

d) Establish a process for information exchange from industry to education to encourage learning.

e) Recognise the importance of "practical placement" components at all levels of education.

3.3 Document and disseminate the generic learning that crosses the boundaries between traditional disciplines within educational programs.

3.4 Foster the engagement of industry with education to jointly develop projects for training and assessment purposes.

Objective 4:

Develop a process and framework for the identification of skilled occupations and recruitment needs within industries utilising emerging technologies.

Addresses

The identification of specific skills within these technologies and the need to map skill development strategies against time cycles of industry/business growth.

Aims to

Identify generic and specific skills required and the recruitment cycles within industries using emerging technologies.

Outcomes Sought

Detailing of appropriate ASCO & ANZIC Codes for skills required for emerging technologies to assist in the identification of new pathways and career options and also to assist with identification of skills should skilled migration be required as part of a short term solution.

Efficiency gains in the ability of skills development programs to deliver skills in accordance with labour market requirements.

ACTION PLAN STRATEGY

4.1 Encourage cross agency networking to share economic intelligence.

4.2 Encourage industry advisory frameworks to outline business plans and labour requirements and where possible directly engage the employers.

4.3 Provide input to the review of skill/job coding and update processes to ensure they reflect emerging technologies.

Emerging Technologies Action Plan

Objective 5:

Identify the opportunities and impediments related to the uptake of training in industries utilising emerging technologies.

Addresses

The need to ensure both human and capital resources essential to business growth and research are supported by, and not in competition with, training.

Aims to

Reinforce the practice of continual improvement in education and training administration and stakeholder engagement with a focus on streamlined processes leading to significant outcomes.

Outcomes Sought

Training and skills development opportunities for emerging technologies converted into outcomes.

Impediments removed or modified to acceptable levels.

Increased utilisation of and participation in skills education and training by employers.

ACTION PLAN STRATEGY

5.1 Identify opportunities to enhance current training delivery processes and maximise linkages of education initiatives and industry training requirements.

5.2 Facilitate processes for industry input to curriculum development.

5.3 Identify targeted training incentives for application across emerging technologies.

5.4 Support contextualised skill enhancement programs.

5.5 Promote the value of cross skilling and upskilling existing experienced workers.

5.6 Identify and promote assistance available to Registered Training Organisations to access/acquire cutting edge training resources relative to emerging technologies.

Objective 1:

Review the extent to which existing mechanisms anticipate, forecast and address emerging technologies skills needs.

Addresses

The need to identify a process or mechanism to investigate current levels of emerging technologies' course participation, anticipated/forecasted emerging skills requirements, timeliness of skill provision against industry need and financial and administrative issues of impact.

Aims to

Improve the process of strategically planning skills development to ensure training arrangements can be rapidly developed and deployed to meet the skill requirements of emerging technologies.

Outcomes Sought

The reduction of skills shortages in emerging technology fields through a responsive training system.

ACTION PLAN STRATEGY

6.1 Profile the current educational, industry and government processes for identifying emerging technologies' skills requirements.

6.2 Develop an emerging skills needs model to anticipate and forecast the future requirements.

6.3 Profile the current student participation and graduate timelines.

6.4 Map industry skills demands against education and training supply.

Working Group Management and Members

Management Committee

Bob Herbert – Chairperson	Chief Executive Officer, Ai Group
Colin Walters – Deputy Chairperson	Group Manager, Department of Education, Science and Training
Bob Pegler	1st Assistant Secretary Dept. of Industry Tourism and Resources
Chris Howells	Chief Executive Officer, Redfern Photonics
Bill Mansfield	Assistant Secretary, ACTU
Brett Lee – Executive Officer	Manager Industry Education and Training, Ai Group Qld.
Steve Ghost	National Manager Training and Education, Ai Group

Working Group

Steve Ghost – Chairperson	National Manager Training and Education, Ai Group
Perelle Scales	Assistant Director, Department of Education, Science and Training
Peter Sesterka	Manager Emerging Industries Group Dept. of Industry Tourism and Resources
Roger Rose	Dean of the Science and Technology Faculty-Canberra Institute of Technology
Linda Franklin	Enterprise Career & Education Foundation
Clifford Trood	Centre Director TAFE Industry Partnership Centre
Sue Hoskings	QA & HR Manager AEMS
Peter Hannigan	Principal Project Officer Industry Relationship ANTA
Kathy Rankin	Training Advisor, Australian Business Ltd.
Jenie Murdock	Australian College of Education
Jessie Borthwick	Deputy Director NCVER, ACT
Brett Lee	Manager, Industry Education and Training, Ai Group Qld
Mitchell Lawrence	Research Officer to the Working Group