Australian Government
Department of Climate Change

Submission to the Senate Inquiry into the Effects of Climate Change on Training and Employment Needs

SUMMARY

- Climate change is one of the greatest challenges facing the world as we enter the 21st century.
- Australia's ability to make the changes necessary to tackle climate change through reducing greenhouse gas emissions and adapting to the impacts that are unavoidable will depend on the skills and knowledge of its people and workforce.
- At this stage training and professional development in emissions management and climate change adaptation is in its infancy in Australia. Academic and training sectors will need to pursue innovative reform, particularly with regard to cross-disciplinary approaches, and acquire greater capacity in human resources and training materials if they are to develop the skilled workforce needed to meet the challenges of climate change.
- Government and independent studies indicate that reducing carbon pollution can be achieved while achieving strong employment and economic growth.
- The labour market will need to be equipped with the skills, education and training required to make the transition to a low carbon future. This will involve more people with the knowledge and skills to:
    - develop and utilise alternative low-emitting sources of energy
    - support business adjust to and comply with the Carbon Pollution Reduction Scheme
- Adaptation to climate change will need to occur across most sectors and at all scales (local, regional, state and national). In a number of sectors adaptation could require a fundamentally new approach to decision-making not based on historical climate. Effective adaptation will need more people with the knowledge and skills to:
    - assess the risks of climate change impacts, using scenario and other futures-oriented tools, particularly on likely changes to climate and weather extremes
    - build resilience of natural and human systems to withstand the projected change in climate
    - understand where adaptation is likely to require transformation, and to plan for and design new approaches suited to a changing climate
    - support decision-makers in optimising approaches to adaptation through, for example, use of tools for cost-benefit analysis and assessment of tradeoffs.
- A mixture of approaches will be needed to support development of the breadth of knowledge and skills required to address climate change. Training for climate change professionals will need to be driven through both academic and vocational institutions, and there is also a need for training programs for non-professionals and volunteers who have important roles in Australian communities, for example emergency services.
- In many ways the need for training of climate change professionals in the Asia-Pacific region is even more acute. Many parts of the region are highly vulnerable to climate change impacts, and there is a relatively low-level of expertise to respond effectively to the impacts of climate change. The Australian Government's three-year $150 million

International Climate Change Adaptation Initiative will make an important contribution to building capacity in the Pacific region in particular. However, sustained support from donor countries and organisations is needed over the long-term to improve the education and skills base of developing nations in our region to adapt to climate change.

SETTING THE SCENE

Addressing climate change is one of the key economic, social and environmental challenges facing Australia and the rest of the world.

Australia is highly vulnerable to the unavoidable impacts of climate change. This vulnerability can be broadly described by the impacts of increasing temperatures, declines in rainfall across the southern half of the continent, rising sea levels and the increased frequency and magnitude of extreme climatic events such as storms, flooding, storm surge, drought and fire. The scale of these projected impacts presents a range of challenges to Australian society, its industries and the environment.

Similarly greenhouse gas emissions are systemic in every sector of the economy and in societal activities.

The Government's climate change policy is built on three pillars:

1. reducing Australia's greenhouse gas emissions;
2. adapting to climate change that we can't avoid; and
3. helping to shape a global solution.

This submission outlines employment opportunities and the need for new skills and training, particularly in supporting achievement of all three pillars of Australia's climate change policy.

EMISSIONS REDUCTION

Transformation to a low carbon economy

The Australian Government has committed to the introduction of an emissions trading scheme as a least-cost abatement mechanism as part of Australia's domestic response. The implementation of Australia's National Greenhouse and Energy Reporting System and the Carbon Pollution Reduction Scheme (CPRS) will raise challenges, as well as opportunities, for Australia's labour market. It will transform the Australian economy, impact on its educational institutions and alter the make-up of the labour market. These changes will be experienced across all sectors of the economy as households, businesses and industries adjust to a carbon constrained economy.

The Garnaut Review (2008) notes that the depth and breadth of the transformation that will be required to meet the challenge of climate change carries significant implications for human resource requirements (Garnaut p501). Garnaut notes that:

"*the transformation will be evolving as the economy in general, and the resources sector in particular, is suffering from an acute skills shortage in engineering, management, finance, and a range of trades";* and that *"maintaining strong investment in appropriate education and training will be an important element in the success of the transition to a low emissions Australian energy sector".*

Treasury modelling of climate change mitigation policy demonstrated that the Australian economy can continue to prosper while achieving substantial emissions reductions. Growth in low emissions sectors will accelerate, and many of Australia's industries will maintain or improve their international competitiveness. This will stimulate employment growth and support the basis of Australia's long term comparative advantage.

A report to the Dusseldorp Skills Forum by CSIRO, (*2008) Growing the Green Collar Economy,* provides more detailed insights on the skills, innovation and workforce dimensions

of the transition to a more environmentally sustainable society, with a particular focus on the challenges involved in achieving deep cuts in greenhouse gas emissions. The report highlights that the economy and opportunities for employment are predicted to continue to grow strongly over the coming decade while dealing with the structural adjustments required to significantly reduce emissions in the economy.

The CSIRO/Dusseldorp report highlights that effective action to transition to a low carbon economy will require attention to both incentives (delivered through the CPRS) and capability across the economy. The report concludes that current frameworks supporting green skills and workforce capabilities are very poor. It suggests that there are significant gaps in workforce and core curricula requirements that need to be addressed before the impact of climate change on employment can be meaningfully met. Addressing capability gaps will require a partnership approach across governments, industry, the education and training sector, and the broader community.

Training needs

The labour market will need to be equipped with the skills, education and training required to make the transition to a low carbon future. This will involve all governments, industry, the education and training sector and the broader community. There will be an increased demand for people with key skills in:

- economics and technology to meet restraints imposed by a carbon constrained world;
- developing renewable energies, including solar, wind, wave and geothermal; and
- assisting businesses, which will require engineers, project managers, corporate finance experts, innovation managers, compliance specialists and greenhouse gas emissions audit experts.

The introduction of an emissions trading scheme will require an increase in training and employment in a number of areas, including:

- Emissions measurement – there will be around 1000 firms with obligations under the scheme, around half of which have never reported their emissions before. Training will be needed to build awareness of obligations as well as the ability to undertake measurement. These skills are most closely aligned to an engineering and financial auditing skills base and most likely the easiest to build on so the industry is ready by the time of implementation.
- Verification/assurance – the industry may need training to build its skill base to service the needs of large entities, which are likely to be required to obtain third party verification on their emissions data.
- Trading hub – the creation of a secondary market will create the need for training and to open up extensive employment opportunities in the financial services sector, which will develop as the scheme details are finalised.
- Taxation/accounting – the creation of carbon pollution permits will also bring with it specific rules around how they are treated in the tax system and training on the practical implementation of the tax treatment of eligible compliance units will assist a smooth transition to the scheme.

CLIMATE CHANGE ADAPTATION

Managing the risks of climate change impacts

In April 2007 COAG endorsed the *National Climate Change Adaptation Framework* as the basis for jurisdictional actions on adaptation over the next five years. One of the key actions in the Framework includes the integration of climate change into education and training for key professions such as engineering, architecture, planners, reserve managers and local

government. An Action Plan to implement the Framework is currently being developed by the Adaptation Sub-Group of the COAG Working Group on Climate Change and Water.

The skill requirements for managing Australia's response to the impacts of climate change span many areas of decision-making in the community, including:

- how the design, citing and maintenance of major infrastructure such as roads, rail, ports and bridges will be affected;
- understanding how the resilience of important resources such as water and energy and can be enhanced;
- appreciating the extent to which ecosystems and natural resource management approaches can cope with the impacts of climate change, and the extent to which transformation is likely;
- understanding the implications of a changing climate for town and regional planning, with a particular focus on incorporating risk assessments in zoning for future development; and
- development of emergency response strategies to meet multiple threats from climate change such as extreme weather events or health issues caused by heat stress or mosquito borne disease.

A report to the Australian Government by the Australian Research Institute in Education for Sustainability (ARIES) (2007), *Shifting Towards Sustainability: Education for climate change adaptation in the built environment sector*, noted that human-induced climate change will require innovative strategies to cope with new situations that emerge from anticipated, unexpected and non-linear climate change, and that the complex and uncertain nature of climate change will require increased foresight and systematic exploration of adaptation options.

The ARIES report found that there was little evidence that conventional tertiary courses or professional development programs were addressing climate change adaptation in the built environment sector. It highlighted the need to reflect on the adequacy of current knowledge, skills and practices that will be needed to effectively prepare or respond to climate change.

Gaps in the underpinning knowledge of how the climate is likely to change increase the challenge of providing effective training in adaptation. There is a continued need to invest in our basic understanding of global climate change and over the last couple of years there has been a dramatic increase in demand by government, business and the community for locally targeted climate knowledge. While the Australian Government's Climate Change Science Program is driving national research to improve our knowledge on the nature, timing and magnitude of climate change, the climate change research community as a whole is struggling for capacity to meet the demand for information, while also continuing to develop the underpinning fundamental science.

There is a need for greater focus in our universities and in major research institutions to develop the new and emerging group of scientists in the range of relevant disciplines to provide Australia's professional scientific capability in future.

Training needs

Effective adaptation to the risks of climate change impacts will require targeted training across virtually all sectors of the economy and society. In a number of sectors adaptation could require a fundamentally new approach to decision-making not based on historical climate. Effective adaptation will need more people with the knowledge and skills to:

- assess the risks of climate change impacts, using scenario and other futures-oriented tools, particularly on likely changes to climate and weather extremes
- build resilience of natural and human systems to withstand the projected change in climate
- understand where adaptation is likely to require transformation, and to plan for and design new approaches suited to a changing climate

- support decision-makers in optimising approaches to adaptation through, for example, use of tools for cost-benefit analysis and assessment of tradeoffs.

To achieve this education and training of future professionals through including climate change in university undergraduate and other courses will be required, as well as updating the adaptation skills of decision-makers in the workforce. Particular areas where action is needed include:

- competency development so that climate change adaptation can be integrated into the core curriculum of undergraduate and accreditation education courses for all relevant professions. Embedding climate change adaptation into courses is essential to avoid it being relegated as optional;
- improvement of the quality and variety of continuing professional development opportunities such as through tailored, short courses, so that gaps in education can be tackled in the near term. Such courses would need to focus on the dissemination of new knowledge and the mainstreaming of adaptation action into vocational practices;
- programs to promote the development of critical cross-disciplinary skills necessary for understanding the complexity of climate change and approaches needed to address them. Key skills include contingency planning, risk management, futures thinking, and systemic thinking.
- Adaptation to climate change will need to occur across most sectors and at all scales (local, regional, state and national).

The ARIES report recommended that the Australian Government take a leadership role in this area through stressing the urgency, clarifying expectations and monitoring performance.

The Australian Government has provided some support for adaptation training in key professions through the $2 million Climate Change Adaptation Skills for Professionals program. This program is a first step to address the need for professionals in the built environment sectors to incorporate climate change adaptation into their work practices. Grants have been awarded to thirteen university and training institutions to tailor curricula to build the skills required for managing risks associated with climate change and integrating climate change science into decisions and planning.

Australia's role in supporting adaptation training in the Asia-Pacific region

Climate change impacts pose serious challenges to many countries in our region, particularly the low-lying, small island states of the Pacific. These challenges include coastal inundation, food security and availability of fresh water. At present in many countries in the region there is a relatively low level of expertise to respond to climate change impacts.

Australia has a role to play in assisting vulnerable countries in the Asia-Pacific region to overcome barriers to adaptation. The Australian Government is investing $150 million over three years through the International Climate Change Adaptation Initiative (ICCAI), commencing in 2008-09, to meet high priority climate adaptation needs in vulnerable countries in our region. A key objective of this Initiative is to enhance the capacity of partner countries to recognise key climate vulnerabilities and risks, formulate appropriate adaptation strategies and plans, and mainstream adaptation into decision making. While the ICCAI is still in a design phase, an initial allocation of funding includes $3 million for the Pacific Future Climate Leaders program, which aims to train Pacific climate leaders through scholarships, exchange programs and community education.

The ICCAI needs to be part of a longer-term strategy as sustained support is needed over the longer term to improve the skills base of developing countries in the region to enable effective adaptation to climate change.