



Australian Association for Environmental Education

Submission from the Australian Association of Environmental Education to the Senate inquiry into its Education, Employment and Workplace Relations Committee on the effects of climate change on training and employment needs.

June 2009

The Australian Association for Environmental Education is a peak body of environmental education experts and practitioners covering a range of expertise from their work in local government, state government, professional associations, university, TAFE, research institutes, education centres and schools. Association members work with a broad range of the community from business to local government, community groups and youth as well as providing professional education and training.

The views in this submission have been generated by several members of the Association. We are delighted to present these views based on the experience of members and drawing from their practice in educating about and for the environment.

Overarching comment

The proposition that there is a "Climate Change Professional" specifically was questioned by several members of the Association on the following grounds:

- Climate change will and is affecting every natural system from water to agriculture to biodiversity. The impacts will be on ecosystem function on which all the life systems that support humans and all other species of the world depend. As people get the message and increasing climate induced crises occur there will not only be the need to cope with those crises but also the need to manage the psychological problems that will increase throughout the population such as depression and anger etc.
- Therefore it is suggested climate change is a sustainability issue – it will have enormous impacts, in Australia and on the less developed nations of the world. Managing the impacts and adapting to climate change requires an integrated and systemic approach. A climate change professional then is a sustainability professional, encompassing a huge range of skills and knowledge for diverse contexts that span both content and social change processes. The aspects of capabilities and competencies span managing risk and complexity, agricultural practice, transformation to clean energy, calculating carbon emissions, developing carbon market policies and practices, planning transport, urban development, food and water security, biodiversity assessment and enhancement and new initiatives such as bio-char, wave and geothermal energy generation.

- Education on all aspects of sustainability is needed to develop more systemic approaches, to develop approaches that lever change on the root causes of unsustainable practice, since simple problem solution analysis is inadequate. For example municipal waste that council's send to landfill can create more impact on climate change (collection, transport and methane emissions from landfill) than all the electricity and vehicle usage of that council.
- Climate change is a crucial issue to deal with urgently as a part of a sustainability strategy. Yet the solutions suggested (changing light globes) are not preparing society for the major changes required in the ways we go about our economic activity – introducing cradle-to-cradle production, moving off fossil fuel dependence, polluter-pays approaches, sustainable consumption in the wealthy elite of the world, lifestyle modelling and adopting the precautionary principle. We need a major effort in education combined with a vision of a sustainable lifestyle and strong leadership.
- An all-of-government approach to education for sustainability is required along with a lowering of bureaucratic barriers to enable learning and exchanges and collaborative programs.

1. What is the present demand for climate change professionals?

- Climate change is perceived as a rapidly developing area. There is high demand to assist with policy development at multiple levels and implementation in local government, community, NGO, industry and businesses.
- **Local Government:** the work of local government includes waste collection and treatment, vegetation protection and the application of local planning statutes. There are significant climate change implications, in mitigation and in adaptation, to be integrated into their core business. Further, local governments necessarily work within their municipal boundaries, yet the issues posed by climate change work across those boundaries. Regional approaches involving adjacent councils in collaborative projects can augment the work within any one council yet keep the focus at the practical level at which councils work. Therefore there is the need for professionals with an understanding across the diverse issues of climate change mitigation and adaptation. Councils need to be able to plan with their communities to adapt, to develop educational programs for sustainable consumption and climate change mitigation and foster community resilience and adaptability. An important aspect is networks with those who can provide robust and informed advice, provide training, seminars and one on one advice. Councils though need institutional changes – such as legislation to enforce higher standards in green building codes and maintenance/ restoration of natural vegetation.
- In one Victorian local government area there is a household greenhouse emission reduction target of 10% by the end of 2010. To audit and implement changes in the 90,000 households of the municipality, this will involve 20 auditors working full time over two years. Most Victorian councils have a 20% reduction target. There are 79 councils in Victoria and it does

not take much maths to realize what an immense shortage of trained staff there is to help meet council targets. And then there is business!

- ***Business and Industry:*** There is a need for business to start implementing and recognising the role the environment has to play in its day to day operations. Demand for expertise will grow rapidly as medium to larger enterprises get past the compliance mentality that generally afflicts medium to large business. Only a few have the capital and foresight to look at sustainability from a climate change 'risk' perspective. In the experience of some members, most medium enterprises (and some of the larger ones) still lump their environmental responsibilities with safety and health. Therefore, you have one staff member holding three hats. It is impossible to expect these individuals to have a good understanding of all three areas and be able to deal with the relatively new area of climate change and corporate risk as well as looking at newer compliance issues that will come with climate change legislation and GHG emissions recording. There still appears to be a poor understanding that all one has to do is offset ones emissions and everything will be OK. Businesses, particularly small medium enterprises have not attacked the efficiency end of the equation sufficiently well and need help to do so.
- The demand for sustainability professionals is already rapidly increasing. In Western Australia at least with the resources boom and the recent carbon policies of the Australian government there is a large number of advertised positions vacant. In recent years 100% of regional campus graduates with environmental science type qualifications tend to be employed before the end of the university summer holidays.
- ***Formal education:*** Climate change should be approached within the need to reorient education to sustainable development as suggested in the UN's Agenda 21 chapter 36 and the UN Decade of Education for Sustainability 2005-2014. The vision of the Australian government strategy for the Decade¹ is
 - *“at the end of the Decade the Australian community will have the understanding, knowledge, skills and capacity to contribute to sustainable development and will embrace the intrinsic value of sustainability as a national aspiration. Our ultimate vision is a sustainable Australia.”*
 - The Australian government's effort to develop a national curriculum standard is based on literacy and numeracy. We argue the national (and state) school curriculum should embody sustainability in an approach (as in the Decade vision) that leads to capabilities and competence in sustainability and development of sustainability citizenship. This is not an “add on” education but a reformulation of education that leads to more holistic, systemic and ecologic based thinking that develops democratically engaged citizens who are literate and numerate.

¹ Department of the Environment and Heritage 2007 Caring for our Future The Australian government Strategy for the United Nations Decade of Education for Sustainable Development, 2005-2014 p.4.

- All teacher training courses should have a compulsory component - "Teaching for Sustainability" in which they are given the opportunity to develop the knowledge and strategies to educate for a sustainable future. Regardless of the field in which they are being trained, they can develop an understanding of how their discipline can contribute to teaching for sustainability, rather than the excuse we often hear about no more 'additional curriculum areas' and the 'crowded curricula'. Teachers need a holistic understanding of sustainability as an outcome of the curriculum rather than as an area of the curriculum.
- Teacher education needs professionals who can help pre-service and in-service teachers understand climate change and translate that understanding into knowledge relevant to the cognitive capabilities of different age groups and develop skills to take action. However the current curricula orientation does not generate demand from teacher training institutions to develop such capabilities in teachers. For example: education for sustainability was not included in the new Victorian Essential Learning Standards as a priority and very few schools are able to offer Environmental Science at year 11 and 12 as there is a lack of skills to teach it.

Of course there are some projects to educate students about climate change issues and actions already, e.g. the Sydney Schools Climate Change Forum in State Parliament (2007) which will likely run again in 2008. This project is linked to schools signing the Sydney Schools Climate Change Protocol committing schools to actions to reduce GHG emissions. Note however that efforts to take such successful pilot programs statewide are blocked by rules such as a teacher appointed to the Sydney Region cannot be released to expand the program.

A few secondary teachers in Victorian schools teach VCE Environmental Science (year 11 and 12 course), an important introduction to sustainability education at tertiary level, but few schools offer the subject, because of lack of expertise amongst teachers. There is no funding available for an updated text book, which would enable less experienced teachers to have the confidence to offer the subject to student.

- Universities and TAFEs need to develop capabilities and competencies respectively to consider and act for climate change. There is an Australian Government initiative funding some universities and professional associations are undertaking to integrate climate change mitigation/adaptation into education. A part of these projects there is an enquiry amongst professionals and employers as to the skills/ knowledge required.
- **Community education:** There is a high demand for communicators to engage with the community on climate change and associated issues for educating and increasing awareness in the broader community as to 'what this means to me' and 'what can I do'. The challenge is helping the community to understand and accept how serious climate change is and yet not scaring them too much. On the other hand as mentioned we need a positive vision of a future in reduced carbon emission future.

- Another great need is for auditors who can work with households and industry to provide an audit of practice and provide recommendations on what and how to make changes.

2. What knowledge and skills do climate change professionals need now?

The knowledge and skills for climate change professionals includes the following competencies and capacities.

Knowledge ABOUT climate change

- Able to understand, interpret, analyze and synthesize climate change science (from diverse fields) and to explain it to others and to be able to engage in dialogue to counter climate change sceptics;
- Understand the scientific knowledge of climate change impacts on weather, ecosystems, species, human societies, urban development, agricultural and coastal communities and environments; food and water security; and its impacts on the more vulnerable sectors of society nationally and internationally and possible solutions for all;
- Sustainable consumerism and production processes and efficiency; low carbon production and a consumer carbon labeling system;
- Energy generation and a range of solutions;
- Flood and disaster management;
- Sustainable building design and construction;
- Waste management;
- Globalization issues and solutions including the impacts of international trade on climate change mitigation and adaptation.
- Trends in society including atomisation and a range of solutions;
- Environmental economics and actuarial skills;
- Carbon accounting;
- Emissions trading scheme; the science of carbon offsets;
- Knowledge of legal and/or liability issues;
- Understanding limits of climate impact models, access to modelling and other tools or ability to design/develop tools, interpreting and assessing possible local impacts of climate change from broad scale information currently available; though there is a need for more specific or more localised information.
- How to develop and implement climate mitigation policy and practice;
- Technical skills and practices in trades and technical staff to work as "climate change professionals" to lower carbon and equity impacts.
- Understand the reasons and strategies for climate change adaptation such as managing adaptive policy and management processes in planning at community, local, state and national government levels; business, developing tools to assess community resilience.

A recommendation to support educators is providing an easily accessed resource (website) where the latest scientific positions on climate change are available; new developments such as the Carbon Pollution Reduction Scheme are summarized; information on grants and other sources of support. The NSW Sustainable Schools Website (NSW DET and DECC) has potential to achieve /fill this role but requires a dedicated team of web builders/scientific consultants/environmental educators to achieve this and keep it current.

Knowledge about how to ACT FOR Climate Change Mitigation and Adaptation

Without education any emission reduction strategies will fail for lack of community support. The current 70% support for Government action on GHG reduction will dwindle unless focused through education/community action programs. The Landcare project could be expanded into a major 'Climate Care' project for the 21st century with educators/facilitators/coordinators to bring communities together around the issue and provide expertise to guide action.

As we are dealing with uncertainty and complexity and a changing world with no absolutes climate change professionals need **process skills** such as those in education (learning and teaching), facilitation and community engagement. An important skill is learning through reflection on action (such as “action learning”; “double loop learning” and “triple loop learning”) that assesses the assumptions of our original thinking. This means valuing learning from mistakes, as well as learning from multiple perspectives and sources. Essentially Australian society has to be engaged in a major learning process towards sustainable consumption and production for a low carbon economy. The skills essential FOR taking action to address climate change include:

- Deciding where and how to take effective action in keeping with the urgency required to mobilize society, and be skilled to motivate others.
 - Facilitating multi stakeholder learning processes;
 - Managing networks and communities of practice to increase availability of advice from practitioners/ professionals.
- Using multi-disciplinary approaches to solving problems; the ability to think and work in integrated ways and with long time frames;
- Managing learning processes in organizations and bringing about change to work with uncertainty and complexity – moving from conventional static, rule based, formal, fixed, linear and boundary bound institutions to ones that are more dynamic, flexible, overlapping, socially defined, emergent and systemic in approach – and that encourage innovation and imagination;
- Communication skills:
 - to involve the public in agenda setting, policy forming as well as implementation;
 - skills to listen to and communicate with different audiences in appropriate ways, to use of narratives;
 - compose active and positive messages to avoid listeners/stakeholders feeling overwhelmed or unable to act in the face of adversity and to avoid depressing children;

- able to link human practices and other environmental problems to climate change – and vice versa.

3. What is the likely future demand for climate change professionals?

The demand will increase dramatically as climate change impacts are increasingly felt and local councils, schools, public and private institutions and businesses and corporations finally acknowledge that they need to make drastic changes to their practices. Radical changes will be needed in a widespread manner – across all sectors of society from households to corporations. Some area mentioned by AAEE members include:

- educators; communicators of effective messages; community facilitators/leaders; we will not educate 22 million people without significant human resources;²
- practical people - household auditors, green electricians and plumbers, climate change aware farmers, glaziers, insulation installers, emergency services, etc
- professional people who understand the psychology of social change; architects; planners with an understanding of sustainability and climate change; natural resource managers, all of government staff capacity to integrate climate change/ sustainability;
- disaster planners and managers (fire to flood and storms);
- innovation in technology for low carbon/ materials use and cradle to cradle production processes;
- media analysts who can assist the community in assessing bias in media information;
- the areas relating to the financial side of business and business risk. As we transition to a low carbon economy the demand for expertise in this area will be high. The question comes whether this capacity will be grown internally in a business or whether there will be a demand for 'new' professional climate change officers within corporate structures.
- some larger businesses such as mining contractors have recently advertised for a sustainability manager to both look at their companies GHG emissions, monitor and reporting to government and educate sub contractors in sustainability. It is expected that this will continue to spread across the corporate sector as the need for reporting, monitoring and management of GHGs.
- expansion of the number of professionals available who can visit schools, community forums or provide advice to teachers about the local effects of climate change. (Those already in the field are purportedly too busy.)
- skills in training and delivering projects to establish youth networks to empower students to speak and act on the issue.

4. What knowledge and skills will they need?

- See points covered in current skill needs above.

² In NSW Department of Education and Training there is 1 ONE Climate Change Education Co-ordinator in the Environmental Education Unit to service 2,200 schools.

- Scientific knowledge of climate processes, variability and controls, significance and relevance of climate processes in relation to environmental and other sciences, policy, planning implications of climate changes on regional and global scale.
- Skills to impart this knowledge to the wider community.
- Encouragement of innovation and imagination.
- Research skills and commitment to ongoing personal and professional learning, to ensure they keep up to date with scientific and policy knowledge in a range of fields such as those listed above.
- Issues associated with public health will increasingly impact upon sustainability professionals' work as climate change brings new diseases previously extremely rare in Australia. These include malaria, dengue, Japanese encephalitis and other mosquito-borne diseases common to tropical areas and other health impacts caused by severe and sudden storms such as dysentery and typhoid.
- A basic secondary school education of sustainability issues will make a big difference to knowledge, skills and attitudes in the community, where the changes need to occur in consumption patterns, reuse and recycling, consumer choices about transport, etc. Educated community members will be more understanding of government policy with regards to emissions trading, fuel costs and other impacts of planning for climate change.
- Increased growth in adaptive skills in agriculture, building materials, engineering.

5. How well placed are universities to meet this present? future demand?

- There is the Griffith University based National Climate Change Adaptation Research Facility (a consortium of universities) is oriented to establish research and research networks on climate change adaptation; however the mechanisms to orient research to key management questions and educational needs has yet to be demonstrated;
- By and large, universities are generally not well placed to meet the present or future demand for climate change education. Universities still operate using silo-models of knowledge whereas increasingly climate change professionals will need to be integrators drawing from a wide base to apply to their specialist field. At present only a few universities have sustainability degrees which provide a broad base of sustainable development skills. Of interest is Macquarie University's new graduate capability statement: it includes a capability for sustainability.
- Importantly, very few universities have sustainability-related units of study outside environment schools such as within their specialist fields such as accounting and business.

Some universities have one sustainability-type unit in their non-environmental/sustainability related courses, but one unit is grossly insufficient for the changed professional world which is rapidly appearing.

- Many universities provide knowledge of climate science, and some understanding of impacts (though this is weaker in the social sphere); some address impacts in agriculture though climate is only one factor exerting change which has to be managed or adapted to; it is believed most universities do not focus on an integrated approach to climate change and how to develop social change, resilience, and to adapt to climate change. Some initiatives we were informed about include:
 - Ballarat University is developing an approach with content and skills via developing units for teaching Education for Sustainability for the School of Education at present.
 - The University of WA introduced the four year degree Bachelor of Science (Climate Studies) during 2008. This program builds on UWA's current expertise to provide an integrated approach to the analysis of climate processes, interaction of atmosphere with other components of the Earth System and economic and policy issues associated with climate change.
 - Edith Cowan University and University of the Sunshine Coast have a climate change adaptation degree.
 - Master of Environmental Management UNSW is designed around the need to work with and understand many different professional approaches to and impacts from environmental management - including climate change – and working with different stakeholders from NGOs to different levels of government, industry and business.
 - Macquarie University has a climate risk research core;
 - Macquarie University Graduate School of the Environment is reviewing many units to integrate climate change adaptation / mitigation in its post graduate planning, environmental science and management and environmental education and sustainable development degrees. This work is funded under the Australian government small grants scheme given to a number of universities and professional associations to develop such education.
 - Macquarie University Graduate School of the Environment and the IUCN Commission on Education and Communication has organized a workshop of university climate change educators and professional associations to share and exchange approaches on climate change adaptation October 2nd. (This includes the grant holders from the Australian government).

- University of Tasmania is also developing climate change undergraduate and post graduate education;
- Smaller universities have difficulty in having staff with a broad range of specialties like climate change and will find it difficult to offer such courses unless more collaboration is encouraged.
- People who can bridge both worlds of academia, theory and the realm of the practitioner are of fundamental importance in meeting present and future demands.

Recommendations in regard to universities

AAEE recommends that all universities:

- Make sustainability a graduate capability;
- Provide for academic debate on sustainability;
- Provide teacher education for sustainability: Develop guidelines in teaching Education for Sustainability but not just "Climate Change" as though that is the only issue³;
- Integrate sustainability/ climate change in all programs;
- Expand opportunities for academics to have an experience in community institutions, support schools and community programs and reward that;
- Provide advocacy in the community for addressing climate change and sustainability;
- Develop partnerships with industry and government on climate change research.

6. How well placed are other research and training institutions to meet this present? future demand?

AAEE recommends that all educational institutions of all types incorporate sustainable development principles and climate change responses into all their courses, such that these studies comprise a minor or major component depending upon the course.

7. How well placed are TAFE institutes to meet this present? future demand?

- Whilst some TAFE courses have responded with sustainability/climate change acknowledgement and inclusion, by and large the TAFE sector has responded in a similar manner to universities – ad-hoc and grossly insufficient reforms to their operations and courses.
- It is acknowledged there are many people within the sector lobbying for greater work around both climate change and environmental management from both organisational and curriculum perspectives.

³ See Professor David Lindenmayer "On Borrowed time"; nor just as a "whole-school approach" to sustainability: it needs to have specific, scaffolded, explicit teaching that is well taught, and show teachers 'how' to teach it well.

- In Victoria one TAFE institution trained staff on the understanding of Climate Change, encouraged professional development and expected every teacher to include elements in their classes.
- In Queensland there appears to be no recognised TAFE courses in sustainability per se. They are most likely lumped in with general environmental studies in conservation and land management. There are no TAFE courses that deal with cleaner production, eco efficiency or climate change. There is a huge opportunity for TAFE's to provide nationally accredited courses in these areas (provided that there are enough professional teachers available to develop curriculum and teach).
- The TAFE sector has untapped potential here, but the distinction between state jurisdictions and the national structure needs to be removed. Good work done in one state needs to be spread nationally as easily as possible.

Recommendations for TAFES

- AAEE recommends that all educational institutions of all types incorporate sustainable development principles and climate change responses into all their courses, such that these studies comprise a minor or major component depending upon the course.
- Provide opportunities for TAFE's to talk to each other, share programs and enter partnerships more often with the community sector. Bring back ANTA, abolished by the previous Federal Government.
- Provide teaching in: materials selection and life-cycle management; appropriate pricing for clients; how to communicate messages about climate change and individual responsibility.⁴

8. What measures are required to assist understanding of climate change in the Asia-Pacific region, including provision of training and skills assistance?

- A coordinated research and data collection program is needed in order to document current and accurately predict future conditions that will impact upon biodiversity, water, carbon and food security issues. These are likely to impact upon Australia in a major way through environmental refugees and through climate impacts on Australia.
- Australia could support learning exchanges with Asia / Pacific– there are many solutions in Asia. However supporting transition to a more sustainable society rather than a replication of the usual development model is essential.

⁴ An example is provided about cabinet making. The industry has tight profit margins. While the trades want to buy the right timbers and paints and offer quotes that mean a reduced ecological footprint, the clients are still making purely \$ based decisions, as the eco solutions are around 5% more expensive. Even though clients would fall into the very well off category.

- Orient capacity building—develop the capacity of the organization receiving the aid through staff improvement programs and ongoing learning as well as structural reforms in the organisation – in keeping with sustainability.
- We need serious cultural understanding and trust in the Pacific/ Asian ability to undertake climate change education and integrate in issues in planning etc. We should meet demand as asked for. There needs to be a demand based appreciation of in what contexts we can transfer technology, what social approaches can be shared, how can we involve people in discussions of natural advantage that accept political and trade realities.
- Visual aids/tools to demonstrate theory or projections
 - Ability to relate the information to the individual
 - Identify or highlight benefits/negatives of actions to individuals and/or businesses
 - Empower the community
 - Practical tangible outcomes
- Locally based, relevant education and trade import-export decisions that are centred on the future and current needs of that community within the known and anticipated impacts of climate change on that nation. As with other countries/regions , this involves adapting, changing power sources, consumption habits, fishing practices, building methods and materials use. Response needs are broad, ranging from training and skills in the renewable energy sector to the need to adopt new fishing practices. For some nations - joint planning with host nations for future migration needs will be an appropriate response.

Comments on the terms of reference

The TOR could also include

- What are the skills and knowledge needed in the community?
- What are the structures/mechanisms/processes that need to be put into place to ensure effective and meaningful community input is received?
- What are the skills needed by teachers as they seek to teach climate change into their teaching?
- What is the role for community organisations?
- It is hoped that this climate change investigation has more than “a particular reference” to education and education institutions. Education alone cannot change the world. The TOR must consider how education AND the other motivators for change can work together.

Conclusion

AAEE strongly believe more resources need to be available for all levels of education for sustainability/ climate change from primary through to tertiary sectors and in community education. There is an urgent need to develop capacity of educators throughout the formal system to integrate climate change and sustainability in their work.

There are some instruments available to stimulate a transition to a more sustainable society – such as the Australian government’s strategy “Caring for our Future” – though there is an overall lack of urgency and drive to provide funds and leadership to make it happen.

A strong vision for a sustainable Australia articulated by leadership nationally and locally is an important aspect of helping Australians to realize the extent of changes required to address climate change and consumption. The carbon emissions trading scheme is one strategy that suggests an urgency – though it is of concern that the exceptions to it are growing.

Climate change is an indicator of unsustainable lifestyles. To bring about major change in the way Australians live requires careful thought and implementation. We have learnt about the difficulties of making change without well developed community education, from introducing unleaded petrol to efforts to recycle water in Queensland. Education plays an essential role in policy change and shifting social norms. To ignore that role is to fail the community in preparing for changes that we will have to make.

The AAEE is willing to work in partnership to support capacity to develop quality education for sustainability and climate change.

Contributors from AAEE

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