MONASH
SUSTAINABILITY
INSTITUTE

Committee Secretary
Senate Education, Employment and Workplace Relations Committee
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

*Please note that we were informed by email that submissions would be accepted up until 8th September. I hope that you will receive this submission.*

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

Climate change is the grand challenge of our time. The capacity of universities to meet the current and future demand for climate change professionals, and to assist in understanding and responding to climate change in the Asia-Pacific region, is a critical issue within the broader review of innovation and education policies in Australia. Climate research and education do not respect the traditional boundaries between academic disciplines, or between universities, government and the community. Meeting this challenge requires new forms of training, collaboration and inquiry that encompass environmental, social and economic dimensions. It will require deep engagement across the university sector, building upon strong existing expertise and emerging initiatives.

Significant opportunities exist for Australia if we are pro-active. New markets and services will be driven across a range of sectors through emissions trading, including carbon trading and contracting services, carbon reporting and verification services, development of economic frameworks for evaluation of trading structures, and associated technologies such as smart metering, data management and remote monitoring. There are tremendous opportunities to innovate in energy and water technologies, from low emissions coal to solar thermal concentrators to stormwater harvesting. New undergraduate, postgraduate and professional university programs can be developed to enhance our own capabilities and to attract students from overseas, in areas as diverse as carbon accounting, sustainable investment, water engineering and climate science.

To realize these opportunities, it will be necessary to enhance a range of key areas, both with regard to research and student places. These areas must include:

1. Climate science, comprising the fundamental fields of atmospheric physics and chemistry, meteorology, oceanography, hydrology, and cryospheric studies.
2. Software engineering for climate model development and support, including advanced visualization and distributed computing technologies.
3. Climate impacts research in the allied natural sciences including ecology, hydrology, epidemiology, entomology, and the like.
4. Engineering in the fields of renewable energy and sustainable transport technologies.

Monash Sustainability Institute
Monash University
Clayton VIC 3800
Email: enquiries@msi.monash.edu.au
Telephone: +61 3 9905 9323

5. Social sciences, including sociology, public policy, political science, anthropology, law and economics.

These areas remain badly under-supported and poorly understood, and urgently need development in order to support policy making in adaptation and mitigation.

**Recommendations**

1. Increase the number of undergraduate student places in natural sciences, social sciences, computer science, engineering, law, accounting and economics that can demonstrate well-developed programs that encompass deep disciplinary rigour with broad sustainability perspectives. One model is the Green Steps program, run by the Monash Sustainability Institute in partnership with the Greenhouse Challenge Plus program, which aims to bridge the gap between knowledge acquired at university and skills required in the environment and sustainability sectors, through a combination of training and work-based placements and projects.

2. High quality interdisciplinary postgraduate research takes more time than a traditional disciplinary Ph.D. We recommend that a post-graduate "double degree" program be implemented that, like an undergraduate double major, allows students to undertake a rigorous interdisciplinary program of research by allowing and supporting an additional year for completion.

3. Research in these areas must be better supported through the creation of programs that fund university staff to conduct research and engage students in interdisciplinary areas. Current funding mechanisms favour traditional academic boundaries, and hence new opportunities and revised review procedures must be developed to embrace the interdisciplinary nature of this challenge. As for post-graduate programs, grants should be longer than the typical 3 years.

**About the Monash Sustainability Institute**

The Monash Sustainability Institute (MSI) delivers solutions to key sustainability challenges through research, education and action. For government, business and community organisations, MSI is a gateway to the deep and varied expertise in sustainability research and practice that exists across Monash's faculties and research institutes. MSI unites some of Australia's – and the world's – leading sustainability thinkers in the natural and social sciences. MSI's research and education encompasses five key themes – climate, water, energy, biodiversity and transport – which together inform a holistic understanding of sustainability issues and the development of comprehensive responses.

The MSI Climate Theme is headed by a Federation Fellow, and includes an ARC Professorial Fellow, 4 additional professors, 2 associate professors, and a further 7 full time academic staff. It is the largest such program in Australia. In 2007 we co-launched the Universities Climate Consortium (www.monash.edu.au/climate-consortium) – which

Monash Sustainability Institute
Monash University
Clayton VIC 3800
Email: enquiries@msi.monash.edu.au
Telephone: +61 3 9905 9323

includes Monash University, University of New South Wales, the Australian National University and the University of Melbourne. This was recognition that the scale of the MSI Climate Theme, while large relative to other groups, remains too small to cover the fields relevant to climate change research, or even those relevant to climate science alone. Early discussions on a joint climate change program across these Universities in graduate level training have begun and may offer a nationally strategic approach to excellence in training.

I can be contacted should you wish to discuss these matters further via Amanda.Lynch@arts.monash.edu.au

Amanda Lynch
*Theme Leader, Monash Climate*

*Professor Amanda Lynch, Federation Fellow, is head of Monash Climate and Professor in the School of Geography and Environmental Sciences. From 1992-2003 she worked in the U.S., most recently at the University of Colorado as a Fellow of the Cooperative Institute for Research in Environmental Science. She returned to Australia in 2004. Her interests lie in earth-system science applied to problems of policy relevance. Her approaches include policy analysis, meteorology and global climate modeling. She was a contributing author on the Intergovernmental Panel on Climate Change third and fourth assessments. Current activities include joint leadership of the Universities Climate Consortium, Member of the Premier's Climate Change Reference Group, Member of the Society for Policy Sciences, Councilor of the American Meteorological Society (AMS) and member of the AMS Board on Societal Impacts, International Polar Year National Representative, Councilor of the International Study of Arctic Change, and Deputy Chair of the National Committee on Earth System Science of the Australian Academy of Science.*

Monash Sustainability Institute
Monash University
Clayton VIC 3800
Email: enquiries@msi.monash.edu.au
Telephone: +61 3 9905 9323