MELBOURNE PURE CASE STUDIES

'GREEN' JOBS THEME

INTRODUCTION

Melbourne PURE has undertaken a series of case studies of regionally-significant initiatives in which higher education institutions (HEIs) have been engaged. The purpose of the case studies has been to understand better the conditions and the factors which shape effective engagement by HEIs with key stakeholders in the Melbourne region. Each case study has been chosen because it contributes to a larger theme which has been identified as a key priority for Melbourne: regional innovation systems; 'green' jobs'; and social inclusion and active citizenship.

This paper has two purposes: firstly, to provide some conceptual framing of the 'green' jobs theme: what its key elements are; and, how higher education institutions (HEIs) are relevant. Secondly, to draw together the insights from the series of case studies which have been undertaken on 'green' jobs in the Melbourne region, in October-November 2009.

This area of the work has been interesting because of the incipient nature of most of the initiatives which have been explored. In conducting the regional innovation systems case studies, there was little difficulty in finding potential interviewees. However, with most of the 'green' jobs initiatives, at most two or three people could be identified to explore each initiative. Therefore, this paper incorporates the summary of each of the 'green' jobs case studies that were identified for inclusion in this project.

IN BRIEF:

- While there is extensive discussion about 'green' jobs, there is little clarity about the concept**;**
- Numerous interviewees commented that the issue is not so much 'green' jobs, but green skills;
- New policy needs to address not only incentives and settings to shape industry performance, but also systematic attention to green skills and training;
- Based on five case studies, there is a considerable amount of activity that is in its early stages, but no example of real developmental work in which clear sustainable outcomes have yet been achieved;
- There is no forum or opportunity for government, business, unions, the third sector and the higher education sector to work collaboratively on either the employment opportunities or skills dimensions of the challenges which lie ahead;
- The challenge is to connect the sites where the conversations are occurring in a way that reduces fragmentation and achieves greater critical mass than is happening at present**.**

WHAT MAKES A JOB 'GREEN'?

While there is extensive discussion about the prospect of 'green' jobs, there is little clarity or literature about how the concept of 'green' jobs is evolving. Other than an assumption that increased attention to environmental practices and sustainability outcomes will have employment implications, there seems to be few clear parameters of the kinds of opportunities which are likely to emerge. This is compounded by apparent confusion about whether the 'green' applies to industries or to occupations. For example, renewable energy production and distribution is an industry that might involve much the same kinds of occupations as many other industries, whereas a biodynamic horticulturalist is a 'green' occupation, whichever industry it is found in. Design professionals might apply their professional expertise equally in the interests of sustainability, or enhanced productivity.

Much of this is acknowledged in a new British report which notes significant inconsistencies in various studies on this subject. Their report comments on the inclusion of supply chains in their calculations of number of green jobs, even though they also supply established industries. Public transport employees tend to be neglected also in these studies. They comment that:

> Generally, the term 'green jobs' is usually taken to mean occupations that contribute to maintaining or enhancing environmental quality. The differences tend to depend on where one decides to draw the boundary. For example, historically, green jobs were generally considered to be in the fields of biodiversity and nature conservation, environmental consultancy, waste disposal and pollution control. More recently, the definition has been expanded to include 'low-carbon' jobs in renewable energy, energy efficiency, low-carbon transport fuels, climate change consultancy and carbon finance. (Bird and Lawton 2009, 14).

Environment Victoria recently published a report advocating that green jobs represented an important opportunity for Victoria. The report profiled five industries, with only passing references to the implications for specific occupations. The industries were solar; rail; energy efficiency; recycling; and wind.

In April 2009, the Allen Consulting Group presented a report on economic opportunities arising from climate change. They examined a series of industries (biotechnology, medical and veterinary technologies, advanced materials, energy, engineering, construction, water, education) and 'other services' in which it could be anticipated that there will be a significant increase in investment in response to climate change requirements. They assessed various risks and opportunities in relation to each of these industries, but did not examine specific occupational or skill implications.

Numerous interviewees commented that the issue is not so much 'green' jobs, but green skills. One person commented that 'someone could work in a 'green' organisation, but their job be quite normal (ie. IT officer), where as someone else could be working in an office not deemed as 'green' but have the role of reducing their footprint'; hence, be quite 'green'. From this perspective, all occupations can expect to be affected one way or the other. The importance and relevance of green skills for jobs might be classified in the following terms:

a) Existing jobs will all require additional skill sets related to ethics and sustainability. Some will be affected more than others, requiring new expertise and some new technical skills - trades and engineering, for example;
b) New jobs in existing industries which derive from the climate change adaptation initiatives - new mix of technical skills plus ethics, as might be found in mining or construction industries;
c) New and expanded industries using existing technical skills plus ethical understanding and new technical skills, such as might be found in renewable energy sources; and
d) New and expanded industries using new occupations (technical skills plus ethics and sustainability, yet to be developed).

This raises questions about the generic skills that might be associated with commitment to sustainable practices, and about new intellectual and technical skills that might be required for occupations/industries that result from commitment to sustainability:

> … more people are going to be taking on green training or sustainability aspects to their jobs... but how much time do they need to dedicate; or how much of the broader business needs to be involved in green aspects - for it to be considered a 'green job'? Green skills may be the more appropriate definition ... there appears to be many grey edges to the term 'green jobs'! (Interviewee).

A focus on skills for sustainable development has been of increasing importance over the past five years. A number of reports and books have begun to address the question of skills, following the principles of the Bonn Declaration that was the outcome of an International Conference on Work, Citizenship and Sustainability in October 2004. With participants from over 100 countries, this conference was an important forum for exploring the implications of the challenge of sustainability for technical and vocational education and training (TVET). The Declaration encompassed economic and social sustainability as well as environmental concerns. Specifically, it called for the integration of environmental sustainability into all aspects of TVET, including understanding of environmental concepts; reflection on personal attitudes; and skills for critical thinking and practical action (see Fien et al 2009). The TAFE Directors' Association is playing an important role in this development in Australia.

Focused on Australian circumstances, Hatfield-Dodds et al used two different types of modelling to explore the economic and employment implications of reductions of net greenhouse emissions of 60-100 per cent by 2050. They concluded that continued growth in employment and living standards was compatible with both these scenarios, but:

> … achieving the transition to a low-carbon sustainable economy will require a massive mobilisation of skills and training - both to equip new workers and to enable appropriate changes in practices by the three million workers already employed in … key sectors influencing our environmental footprint. (2008,1).

In their view, new policy needs to address not only incentives and settings to shape performance, but also systematic attention to green skills and training. Work on this is well

underway, under the auspices of the Industry Skills Councils (ISCs). The ISCs have been reviewing training packages to assess their capacity to support learning for environmental sustainability, finding that it is covered already at a number of levels. Most are extending their Packages' coverage of sustainability issues. They have reaffirmed the importance of an industry-focused and driven approach, while acknowledging the key role that the tertiary sector will play in disseminating skills and knowledge, and in bringing about organisational change. They have reaffirmed also that the skill needs and drivers vary from sector to sector, such that a standardised approach will not be effective.

In summary, there continues to be considerable confusion in terminology and in key concepts related to thinking about climate change, environmental sustainability and economic and labour market futures. Policy development in this field is very much in its early phases, and the immediate focus is on identifying relevant skills and knowledge, and how best these skills might be acquired by existing and future employees.

INSIGHTS FROM CASE STUDIES

There are numerous examples of tertiary sector initiative in this field. The Australian Technology Network universities have set carbon reduction targets, the Department of Sustainability and Environment has worked with universities on a range of projects, and Latrobe has initiated some work on sustainability graduate outcomes. Many TAFE groups have worked with their students and industry on sustainability issues. The case studies explored for this project all involved collaborative arrangements that cross either university or industry boundaries.

1. Victorian Centre for Climate Change Adaptation Research (VICCAR)

VICCAR was established to address key knowledge gaps associated with climate change adaptation challenges, including the need to integrate social and economic aspects of adapting to changing climate and natural environment. The Victorian Government has taken this initiative to extend the range of investments which it has made in climate change adaptation research during the past decade. The Centre's research agenda reflects both the seriousness and the uncertainty of the climate change agenda.

In an overview of the Centre prepared by Professor Rod Keenan, its Director, it specifies that the Centre will address identified research priorities for Victoria using multi-disciplinary and multi-institutional teams. The Centre has initially been formed as a partnership between Latrobe University, Monash University, RMIT University and the University of Melbourne. It will provide the opportunity for researchers from all Victorian universities to participate in its activities. The development of the Centre is intended to provide a mechanism for improved coordination of research investment by the Victorian Government in climate change adaptation.

Its key aims relate to improving decision-making about climate change adaptation and improving industry awareness. The primary audience is the Victorian Government. A key focus of this will be adding to the understanding of 'green' jobs, that might be more sustainable jobs in variable and uncertain environments.

Structure and Funding Sources

The Centre is managed under the terms of an Agreement between the State Government (through the Department of Sustainability and Environment) and University of Melbourne, while the four partner universities share an Agreement about their participation in the Centre. There is provision for other Victorian universities to formally become Centre members in the future. There is a Research Investment Panel which provides advice on research priorities and approves the research program and other centre activities.

The strategic directions of the Centre are guided by an Advisory Board consisting of members from the partner universities and an independent chair, while operational activities are directed by an Implementation Committee with members from the partner universities. The Victorian Government has made available $5million over five years.

Main Activities, Opportunities and Challenges

While it is still in its infancy, VICCAR plans to conduct an Annual Forum to bring together researchers and policy makers from across adaptation sectors and showcase and present adaptation research and the outputs of Centre research projects. In addition, at least four regional or thematic workshops or 'think tanks' will be co-ordinated and delivered each year. These workshops will facilitate the understanding of potential climate change impacts and the development of adaptation and resilience in different regions or thematic areas and present research relevant to a region and its adaptation challenges. Research projects will be developed and commissioned through an open (and competitive/transparent) process that provides for potential participation of all Victorian universities and their collaborators, covering key research issues in climate change adaptation and complementing existing or proposed state and national research. Finally, a visiting climate change adaptation fellowship will be offered for up to three months duration in any given year. This will facilitate international collaboration and advise on best practice climate change adaptation in the Victorian context.

The four universities are integral obviously to the Centre's activities. The specific objectives of the University partners are to:

- Provide state and national leadership in climate change adaptation research;
- Support effective collaboration within Victorian universities on climate change adaptation research;
- Support collaboration with other Australian and international partners in adaptation research;
- Foster the development of Victorian expertise and capacity in adaptation research;
- Actively pursue further funding and resources for adaptation research.

They are in the process of determining appropriate critical success factors, and sorting out working relationships with their Federal Government counterparts. A longer term challenge will be understanding how policy and regulation thinking evolves, and developing appropriate indicators. There will be some work in coordinating relationships

across several government departments, and establishing sufficient resources for research. Other universities and TAFE might become involved at a later stage.

2. Carbon Down

Carbon Down was established by the Victorian Employers Chamber of Commerce and Industry (VECCI) with Sustainability Victoria (SV) to reduce the environmental impact of Victorian businesses (with fewer than 100 employees). Its main objectives are to engage 20 per cent of small and medium enterprises, distributed widely throughout Victoria. It focuses on practical initiatives with business organisations to assist enterprises (SMEs) to achieve measurable carbon reductions, change both behaviour and attitudes, and to facilitate learning from each other. VECCI also provides information for SMEs on how to reduce energy, water and waste consumption.

VECCI have 10-12 people actively involved, and provide the steering group for the project, with SV membership. The Government has provided funding for three years. The two organisations conduct an annual business planning process to shape the project's direction.

Main Activities, Achievements and Challenges

So far, Carbon Down has produced a major report on Victorian businesses' knowledge and attitudes to environmental issues, which indicated that over three-quarters of Victorian businesses consider climate change to be a major issue which affected their business (see Elborough and Zosels 2009). The project has developed a number of key partnerships with members including Collingwood Football Club, Simply Energy and Bendigo Bank. These partnerships have facilitated tapping into market sectors that VECCI has not been familiar with. Bendigo Bank has contributed also to a major project on distributing low-voltage light bulbs. There is also a regular column in VECCI publications.

The initial emphasis was on web-based communication but this proved not to be effective with SMEs. Initially, the project began very ambitiously, but has adapted quickly to pick up on opportunities as they emerge.

Apart from Victoria University, through its enviro hub network (see www.envirohub.net.au/Home), the higher education sector has not been involved to date, although there might be some contribution to the evaluation of the first year. There has been some question about whether universities are able to contribute to the work with SMEs. There was some question from VECCI about whether the higher ed sector sees it only as a distribution channel, rather than as a possible partner.

There are a range of opportunities arising from this initiative, including research and evaluation. They include drawing together the learning about appropriate models of intervention in relation both to SMEs and their supply chains, including the possibilities that large companies can influence the practices of SMEs with which they interact. Universities could be involved in the evaluation, but there was some question about their appropriateness for working with SMEs.

3. Victorian Eco-Innovation Laboratory (VEIL)

VEIL was established by the Victorian government, following the government's Sustainability Action Statement, 2006. The key perspective underpinning the establishment of VEIL was the need to step away from a linear approach to economic transition in the face of climate change. The Victorian Government chose to invest in design schools on the basis that change on the scale required in large companies would be driven by design, focused on public outcomes in relation to climate change. VEIL's current focus is on futures planning, to move industry from large production systems to short-run, networked systems that can produce new goods and services, and jobs.

Structure and Funding Sources

VEIL is based in the Australian Centre for Science Innovation and Society at the University of Melbourne, with partnerships with schools of design and architecture at Monash University, RMIT, and Melbourne University, as well as Sustainability Victoria, the Department for Sustainability and Environment, and the Department of Innovation, Industry and Regional Development. It collaborates also with research groups at Swinburne University and LaTrobe University (through its Centre for Sustainable Regional Communities at Bendigo), and with several municipal authorities, utilities companies and non-government organisations. Its principal aim is 'to identify and promote emerging technical, social and organisational innovations that could form part of future sustainable systems' (see www.ecoinnovationlab.com).

Funding is provided by the Victorian Government, with in-kind support coming from the universities. Resourcing has been difficult because the universities have different pricing models, which has made it hard to get a level platform and build collaboration. VEIL has an Advisory Management Board which includes representatives from Toyota Australia, the Department of Premier and Cabinet, the Department of Innovation, Industry and Regional Development, Melbourne City Council, the Department of Sustainability and Environment, and a non-government design organisation.

Main Activities, Achievements and Challenges

Its principal form of activity has been 'Think Tanks' involving public and private partnerships, working in relation to a vision for Melbourne in 2032. This has generated new thinking about food systems, distribution systems and construction design. Student numbers involved in projects have increased,the education curriculum is beginning to change, and commercial partners have become engaged.
The various higher education partners have been involved from the beginning, initially through the heads of Melbourne's higher education design schools being members of the Board. This has not been an easy relationship, as there have been difficulties with getting researchers with sufficient time to participate actively in VEIL projects; part-time assignments have not worked, simply because people's heads are always in different places. The universities have different cultures, and there is an underlying competition which has made it hard to get effective communication and agreements about the legitimacy of the research, and sharing of resources. The universities have seen positive

opportunities for professional development for their staff, and for developing new research areas and methodologies.

There are real opportunities for ongoing development in this area, as there is keen interest by policy-makers in radical thinking about innovation. This will involve public/private partnerships that enable major players to adopt new ideas, and make things happen. VEIL needs a new operational model, with researchers seconded full-time to Think-Tanks, working with industry partners. The 'MediaLab' in Victoria has been highlighted as a potential model, which would draw upon greater involvement of industry at all levels.

4. Horizon 21

Horizon 21 was an initiative of Warrnambool City Council, seeking an opportunity to connect with local small and medium enterprises (SMEs). An informal conversation with local industry leaders led to a proposal for an energy project, linked with Deakin University. A groundswell of ideas emerged, focused on adding value to SMEs business viability and enabling them to become 'more green'. The project is now clearly industry-driven, with Warrnambool Council and Deakin providing administrative support. The focus is on making Geelong and Warrnambool into 'demonstration cities', with projects on energy and water, and also transport fuels. The underlying assumption is that many businesses want to be more 'green', but do not know how to proceed.

Structure and Funding Sources

At present, the group operates largely as a loose-knit network, with all of the partners providing some initial funding. A small number of well-known local business people are providing strong leadership, and maintaining momentum. Deakin University has allocated a staff member to support the project part-time, and her role has been crucial in linking people in the businesses with relevant parts of the University. Additional resources have been sought from Regional Development Victoria for the development of a Business Plan, and then the parties will need to commit to implementation.

There are many projects in the pipeline, waiting for the Business Plan to be completed. The risks to the project include slow response from government, and getting the appropriate balance between industry and university initiative.

5. Green Chemistry and Manufacturing

The Centre for Green Chemistry began in 2000, in response to emerging debates about sustainability, and the prospects for 'greening' manufacturing industry. Its work has been focused on technologies which reduce risk and achieve a greater conversion of resources into product and reduction of waste. It has particular relevance to the food industry, and over the years, has developed a significant international network of universities and 70 companies with which the Centre collaborates. Its turnover has increased over that time to $12 million per annum, with funding derived from the Australian Research Council, federal and state governments, and companies. The intellectual property arising from the research is distributed according to the sources of funding.

The Centre has a Board comprised of mainly external university and industry members, which sets direction for the Centre. While the United States and Japan are now more advanced in the policy development in this field, Melbourne remains the hub of the international network.

Since its formation, a number of commercial technologies have been developed. Its work has been genuinely multidisciplinary, with teams working at different points in the supply chain, which has been a critical ingredient in the Centre's success. The Centre is now developing a two-way approach with industry which is enabling learning about 'scaling up', and how to address the associated cost imperatives. This has been a very difficult process, yet there are great opportunities as manufacturing can change the ratio of waste to resources and introduce more effective processes. During the past eight years, approximately 60 doctoral students have been involved in the Centre, and a large majority have been employed in industry.

There have been real challenges from working between the academic environment and industry. The university has a greater need for transparency and an orientation towards the 'public good', whereas industry needs to be able to work with 'commercial in confidence'. Getting the match right can be a challenge, especially when 'excellence' in research is viewed in terms of publications. Nor are these initiatives supported adequately in the current policy environment. Both the United States and Japan have had experience with 'Green Chemistry Acts', which influence the practice of chemistry and use of research to drive change. This kind of policy sophistication is not yet present in Australia.

Project Example

This initiative began as a collaborative exercise between Monash and CSIRO, developing a specific, novel resource (molecular imprinted polymers, MIPs) that can have commercial value for the food industry. Structured formally as a cluster (also involving the University of Melbourne), the science has progressed very satisfactorily, to the point where it can now be commercialised.

The key to the success of the collaborative project has been rigour around expectations, milestones, and ensuring that each of the parties to the Cluster has a defined role. The leadership of the Cluster has been extremely strong. Funding has been provided by Monash University and CSIRO, with a small contribution from the University of Melbourne. The initial (and important) stimulus was funding from the Federal Government to CSIRO to engage in partnerships with universities.

The challenge is to assist industry to be able to use this kind of technology. It has been difficult to get small and medium enterprises in particular to make space to emplore its implications; there is a need for specific interventions which assist this to occur.

RELEVANCE OF HEIs TO 'GREEN' JOBS: OPPORTUNITIES AND CHALLENGES

These case studies represent an initial opportunity to explore the ways in which the higher education sector is engaged in partnerships to engender greater awareness and action in

the development of ‘green jobs’. Based on these examples, it seems that there is a considerable amount of activity that is in its early stages, but no example of real developmental work in which clear sustainable outcomes have yet been achieved. No doubt there are many other examples which could be explored, but it is unlikely that any would lead to a different conclusion. Australian opportunities can develop around areas where there is considerable experience already, as this will help capture and frame appropriate responses in a time and resource effective manner.

Given the focus on skills outlined earlier, it is apparent that the higher education sector, including VET, has a significant role in reviewing their own qualifications and delivery processes to address the longer term sustainability learning needs of the workforce. Some consideration needs to be given to the most appropriate way to inform as well as engage industry in the early stages of these discussions to ensure that the outcomes will be relevant for their needs.

There is also a significant, internationally-renowned research capability that is being marshalled under the VICCAR framework. Much of this research has been undertaken in conjunction with industry partners, but it has not yet contributed to the policy debate about the employment dimensions of climate change adaptation and mitigation.

There is no immediate indication either that there is a forum or opportunity for government, business, unions, the third sector and the higher education sector to work collaboratively on either the employment opportunities or skills dimensions of the challenges which lie ahead. This raises the question of how best might these conversations be initiated and the appropriate expertise coordinated in the interests of addressing such a significant policy issue. This is likely to require multiple initiatives, but the challenge will be to connect the sites where the conversations are occurring in a way that reduces fragmentation and achieves greater critical mass than is happening at present.

REFERENCES

Allen Consulting Group (2009) *Victoria's Greenhouse Opportunity Set: New growth prospects in a carbon constrained world* Report to the Victorian Department for Innovation, Industry and Regional Development, Melbourne, April.

Bird, J. and Lawton, K. (2009) *The Future's Green: Jobs and the UK low-carbon transition* Institute of Public Policy Research, www.ippr.org (October).

Elborough, K. and Zosels, R. (2009) *Victorian businesses' climate change knowledge, attitudes and behaviours* East Melbourne, VECCI.

Environment Victoria (2009) *Victoria - the Green Jobs State: Seizing the Opportunities* Carlton, www.environmentvictoria.org.au

Fien, J., Maclean, R., and Park, Man-Gon (2009) *Work, Learning and Sustainable Development: Opportunities and Challenges* Technical and Vocational Education and Training Series, Springer.

Hatfield-Dodds, S., Turner, G., Schandi, H. and Doss, T (2008) *Growing the Green Collar Economy: Skills and labour challenges in reducing our greenhouse emissions and national environmental footprint* Report to the Dusseldorp Skills Forum CSIRO, www.csiro.au.

Industry Skills Councils, nd *Environmental Sustainability: an Industry Response.*