Jobs and Skills Transition for the Latrobe Valley

Phase 1: Benchmark occupations and skill sets

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About this Report

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The Australian Government Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE) commissioned the National Centre for Sustainability (NCS) at Swinburne University of Technology and RMIT University's Centre for Sustainable Organisations and Work (CSOW) to undertake a skills benchmarking study in the Latrobe Valley and Gippsland region. This report seeks to identify the roles and the skills of workers in industries likely to be impacted by a transition to a low carbon economy.

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List of Abbreviations

ABS  Australian Bureau of Statistics
ARRA  America Recovery and Reinvestment Act
ASHE  Annual Survey of Hours and Earnings, UK
BIS  Department of Business, Innovation and Skills UK
BLS  Bureau of labour Statistics
CAPP  Central Appalachian Prosperity Project
CEDEFOP  Centre Européen pour le Développement de la Formation Professionnelle/
  European Centre for the Development of Vocational Training
COAG  Council of Australian Government
EC  European Commission
EU  European Union
FEFCE  Further Education Funding Council for England
FIFO  Fly-in-Fly-out
G.I.B  Gesellschaft für innovative Beschäftigungsförderung
GSA  Green Skills Agreement
GVA  Gross Value Added
JARI  Johnstone Area Regional Industries
KEEC  Korea Environmental Education Centre
KESW  Knowledge Exploitation South West
LEP  Local Enterprise Partnerships
LCEA  Low Carbon Energy Areas
OECD  Organisation for Economic Cooperation and Development
NGO  Non-Governmental Organisation
NSA-P  National Skills Academy for Power
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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ONS</td>
<td>Office of National Statistics, UK</td>
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<tr>
<td>RDA</td>
<td>Regional Developments Agencies</td>
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<td>REAP</td>
<td>Renewable Energy Apprenticeships Programme</td>
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<td>REPP</td>
<td>Renewable Energy Policy Project</td>
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<td>SCHRD</td>
<td>Sector Council Human Resource Development</td>
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<td>SEWN</td>
<td>Strategic Early Warning Network</td>
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<td>SRB</td>
<td>Single Regeneration Budget</td>
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<td>SSC</td>
<td>Skills Sector Council</td>
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<td>STEM</td>
<td>Science, Technology, Engineering and Mathematics</td>
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<td>SWRDA</td>
<td>South West Region Development Agency</td>
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<td>SWRESB</td>
<td>South West Regional and Employment Skills Board</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>VET</td>
<td>Vocational Education and Training</td>
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<tr>
<td>WDA</td>
<td>Welsh Development Agency</td>
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<td>WIB</td>
<td>Work Investment Board</td>
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Disclaimer:
While the National Centre for Sustainability at Swinburne University, and its partners in this project, endeavour to provide reliable analysis and believe the material presented to be accurate, they will not be liable for any claim by any party acting on such information.
Executive Summary

1. The Latrobe Valley’s coal-fired power generation industry and its workforce are likely to confront major challenges in the transition to a lower carbon economy. There are signs that workers are already being displaced as power generators reduce their maintenance requirements in response to market pressures, carbon pricing and the contract for closure initiative in which three generators have expressed interest. The loss of jobs and the displacement of workers brought about by these changes are likely to intensify over the coming years. A variety of social mitigation, job creation interventions and skills development and training initiatives will be needed to assist displaced workers and boost regional economic development.

2. This report identifies and describes the benchmark occupations and skill sets of workers in Latrobe Valley power generation sector to inform policy and program level initiatives that will support vulnerable workers into training and employment.

3. This project is funded through the implementation of the Council of Australian Government (COAG) Green Skills Agreement (GSA). The project is principally informed by the GSA’s fourth objective: “to implement a transition strategy to re-skill vulnerable workers.”

4. To address this objective, the overall project aims to identify possible opportunities for alternative employment for those workers potentially displaced by a decline in the carbon intensive industries of the Latrobe Valley. The project involves two principal phases:
   - **Phase I** identifies the benchmark occupations and skill sets of workers in carbon intensive industries.
   - **Phase II** will identify transition opportunities for vulnerable workers in priority industry sectors and occupations where there are significant opportunities for the nature of work and skill requirements to be transformed by carbon abatement.

5. The approach adopted here is one that presents a political economy of skills acquisition, skills recognition and the transition of skills in a changing world. This approach goes beyond the narrow focus on the ‘skills gap’, which rests on an assumption that skills will be, and should be, determined by business interests and concerns. An understanding of skill formation and skill transition challenges during structural change in this broader approach includes an understanding of both the specific socio-economic contexts in which skills are embedded and the dynamics that underpin them.

6. In adopting this approach to a skills analysis, the report draws on research writing and policy development that is at the forefront of world developments. These analysts remind us of the agency of powerful actors--government, employers and trade unions--their competing and vested interests and the ways their interaction shape skill formation and workforce developments. Skill and training requirements, the breadth and depth of training, credentialing and the formal recognition of skills, re-training and transferability of skills, along with remuneration for particular skills, are often deeply contested matters. Such interests and differences point to the limitations and possibilities for skill trajectory development and change.

7. Given the complexity of the power generation industry within the Latrobe Valley, a number of methods have been used to collect the quantitative and qualitative data that informs the project. The report draws on the statistical analysis of data, document analysis, literature review, consultation and interviews.
The Latrobe Valley in Context

8. The region is one of relative disadvantage. Employment patterns are characterised by:
   - Labour force participation that is lower than the Australian average.
   - Over the last two years (2010 and 2011) participation rates have increased because of an increase in women’s participation rates and unemployment rates have declined.
   - There is an aging workforce; evidence of financial anxiety; possible job opportunities; and seasonal variability.

9. As an area which experienced the hardship of privatisation of the electricity sector, and where it has experienced disadvantage in relation to employment opportunity, education, housing and other facilities, governments at every level have proposed a number of initiatives to address these circumstances. With the concern about carbon futures and the related policies that are in the process of implementation, such as the Securing a Clean Energy Future package, governments have commissioned reports (including this one), developed programs of change and committed financial and other resources to the area. Unfortunately, these initiatives often have been informed in ad hoc ways by past enquires.

Recommendation 1

That steps be taken, possibly by the Latrobe Valley Transition Committee in the first instance, to integrate the diversely sourced reports and recommendations on the Latrobe Valley (and Gippsland) with a view to developing integrated and cohesive policies for transition of the vulnerable workers.

Latrobe Valley Power Generation Industry

10. The Latrobe Valley power industry should be conceptualised as a ‘flexible organisational network’ – lead firms and layered contractors providing goods, services and maintenance. This conceptualisation allows policy to be developed in an integrated way for the industry. The generators (including mines) are the lead firms (six in total – Hazelwood, Loy Yong Power - A, Loy Yong B, Yallourn Power Station, Energy Brix and Jeeralang Power Station) and the contractors cover services (including technical services), maintenance, supply and construction. Altogether there are about 40 such firms in the area.

11. The workforce data for the industry is limited and dated; nonetheless it is indicative of the key features of the industry. The power industry workforce employs around 4000 workers (around six per cent of the regional workforce), and nearly two thirds live in Latrobe City area. While the figures are not available it is likely that this number is an underestimate because of the ad hoc employment of workers in outage, maintenance and related work. Although it is not the largest grouping within the Latrobe Valley region it nevertheless constitutes a significant cluster of workers who face an uncertain future.

12. The workforce comprises mainly older male workers with many having none or few formal qualifications. Of those with qualifications men are likely to have trade and technical qualifications, while women tend to have qualifications in management and commerce. Overall, however, significant numbers had no qualifications, with more women without qualifications than men. Of note, most households are disproportionately reliant on male incomes.

13. These patterns of employment play out in very specific ways. They set the scene for the analysis of skills and job roles within the industry. In an important innovation, the focus of the research is not
restricted to individual workers; it is the case that such workers are located in households, and it is here that the circumstances that enable individuals to work, relax and develop are played out. For this reason, it is necessary to consider households in any discussion of transition and change. In the case of the power generator industry, households rely disproportionately on men's wages to sustain themselves and to live appropriate lives.

**Recommendation 2**

That policy on skills acquisition, skills recognition and up-skilling be premised on the understanding of socio-demographics of the workforce in the power generation industry, and that a critical and essential focus is one that recognises and understands the household composition of industry workers and the remuneration patterns that sustain households.

**Roles and Skills in the Power Sector**

14. The workforce in the power generator industry is regarded as skilled and relatively stable, although evidence suggests that security of employment does not necessarily apply to the contract companies that service the generators and mines. Nonetheless, many workers employed by generators have been in the generator industry for ten years or more. Entering the workforce at a young age, and often in the pre-privatisation period, means that there often is a discrepancy between qualifications and skills, with many employees skilled, but without qualifications or skilled beyond their qualifications; in other words, skills are not aligned with national competencies. Recently, and over the last four years in particular steps have been taken to address this situation with evidence that Recognition of Prior Learning is now being encouraged by some generator companies and that new opportunities for training and reskilling are coming into place.

15. The direct employees within the industry are relatively well paid, well above the regional average. Further, contractors also undertake often highly skilled work, although remuneration levels tend to be lower. Because of this remuneration pattern and the skill profile in the industry, there is a complex inverse relationship between skill and remuneration, which in the power generation industry centres on relatively high wages for many and a highly skilled although often poorly credentialed workforce. Nonetheless, despite much negative stereotyping of the workforce and remuneration it must be recognised that these levels merely reflect national trends.

16. Overall, there is a fearful apprehension about the future amongst workers and their managers and technical support staff. This anxiety was evident irrespective of qualification, skill and place within the companies that constitute the power generation industry.

**Recommendation 3**

That steps be taken, possibly by the Latrobe Valley Transition Committee in the first instance, to promote integrated and cohesive policies and practices on skills acquisition, skills recognition and up-skilling for possible emergent opportunities in the overall regional economy of ‘green’ and/or sustainable jobs as well as decent jobs in the future power and coal industry.
Emergent Themes about Transition

17. Power generator workers are anxious and feel vulnerable. This uncertainty and sense of vulnerability is also evident among contract managers and workers. However, and of particular note, while there is an anxiety about the future in the contract companies, a number of these companies have taken steps to protect their business, via diversification.

18. One particular fear among all workers was that they felt that they would probably be ‘forced’ into Fly-In-Fly-Out arrangements to survive in the uncertain economic future. Given memories in the area, and the contested history over privatisation and its aftermath, as well as the seemingly constant comment about a two-tier Australian economy, there is a well-grounded and very strong awareness of the social consequences of such arrangements. These sentiments are also tied to a strong sense of place amongst workers. They have a strong attachment to the area, and compelling social reasons for maintaining this attachment.

19. Workers are aware of the problems of out of date or minimal qualifications. For many power station and mine operators redeployment options outside the industry are extremely limited due to the nature of their skills and the lack of formal qualifications.

20. While there is little evidence of an awareness of the possibility of a ‘green’ transition, among unions, workers and some contract management there is a strong view that the transition that is taking place should be planned, managed and ‘just’ in its focus and outcome.

Recommendation 4 (Report sections. 8.1.4 – 8.1.8):

R4.a. That the options for a job transfer scheme for workers displaced following the closure of a power generator and any associated contract companies should be considered as part of the contract for closure and structural adjustment package, with skills at its core.

R4.b. Consideration should be given to outlining and publicising the components and details of a planned, managed and ‘just’ transition, with skills at its core. To address this proposal, governments should examine options for the development of a ‘Workers’ Transitional Centre’.

R4.c. That any transition program should be designed with the whole region as the reference, including the development of regional plan that addresses all sectors; the Latrobe Valley Transition Committee should oversee this task.

International Lessons

21. A comprehensive review of international experiences identified the way that many countries face similar problems and experiences to those of the Latrobe Valley region. In the evidence presented, it is apparent that most similar regions have struggled to remedy the negative effects of decline and closure of major industries. Apart from the Ruhr region, all regions have struggled to diversify economically.

22. Governments at all levels are critical to success. Nonetheless, the evidence demonstrates that government action and involvement is often uneven and sporadic, but the evidence also shows that government action, at all levels is critical to positive outcomes. Additionally, the evidence is also suggestive that the policy focus on such regions provides stark opportunities to develop transition programs towards low carbon economies.

23. The analysis shows that success is highly context specific and involves:
• Early retirement strategies and job transfer schemes
• Planned state policies and practices are critical
• ‘Green’ development initiatives usually create jobs
• Successful training and education schemes require a multi-stakeholder involvement, including education and training bodies, business, government and unions and Non-Governmental Organizations
• Appropriate job transfer depends on both skills and opportunity
• A recognition that employment adjustment depends on multi-level government involvement working with regional stakeholders.

**Recommendation 5**

That employment adjustment programs elsewhere should be examined and evaluated to determine the drivers of success.

**Priority Areas for Policy Responses**

24. Thus it is desirable that all policy initiatives are explicitly informed by a recognition that there are three distinct types of response to address displacement – reactive, dispersed and comprehensive (see section 6.3.2) - and that each has different implications for outcomes. In relation to immediate transition needs of vulnerable workers:

**Worker displacement**

• Retirement and early retirement schemes should be put in place prior to closure.
• Voluntary departure packages should be established for all workers employed by the generator or generators signalled for closure.
• Early retirement and voluntary departure packages should be extended to contract companies, particularly continuous presence contractors, associated with the generator(s) signalled for closure.
• Early retirement and voluntary departure schemes should be extended to other generators and continuous presence contractors not targeted for closure.
• A job transfer scheme should be offered for workers displaced from the closure of a power generator and its associated contract companies.
• Financial support should be offered to generator companies and affiliated contract companies participating in the job transfer scheme where substantial re-training of workers into new occupations can be demonstrated.
• Companies that receive a contract for closure should be required to develop a job relocation scheme.
• Companies that receive a contract for closure should be required to complete a comprehensive skills audit of their workforce and assist workers obtain accreditation for the skills they have acquired on-the-job.

**Job Creation and Worker Assistance**

• An initiative to establish and operate a Workers’ Transitional Centre providing a locally-based and focused resource for counselling and training.
• Centre could promote re-training of displaced workers for meaningful long-term work.
• Centre should not only address displaced employees but also households.
Employment Adjustment

- The transition that is underway could be promoted as part of an employment adjustment program for the region, under the auspices of the Latrobe Valley Transition Committee.

Alternative site development

- Rehabilitation of mining and power generation sites as part of closure arrangements, with appropriate staff training.
- The redesign and retro-fitting of disused power generation facilities (e.g. workshops) for alternative purposes.

Conclusion & Recommendations for Phase II

25. The current report is the first stage in a comprehensive skills audit and analysis of the Latrobe Valley, and by extension Gippsland. It develops the methodology for such work, and has proven the viability of the procedures that have been put in place for such work. Leveraging on the information presented within this report, further research is required to map the roles and skills required for the region to implement its Low Carbon Growth Plan and other key economic development opportunities within the region.

Recommendation 6

That Phase II of this project should proceed to identify and map the roles and skills required to deliver the region’s Low Carbon Growth Plan in the context of the region’s industry growth trajectory.
1. Introduction

The Commonwealth Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE) commissioned the National Centre for Sustainability (NCS) at Swinburne University of Technology and RMIT University’s Centre for Sustainable Organisations and Work (CSOW) to undertake a pilot research project titled ‘Jobs and Skills transition for the Latrobe Valley - Implementing the Low Carbon Road Plan’.

This project is funded through the implementation of the Council of Australian Government (COAG) Green Skills Agreement (GSA). Endorsed on 7 December 2009, the GSA outlines that:

‘the transition to a sustainable, low-carbon economy will create opportunities as well as challenges……. This transition will have implications for training providers and workplaces across the Australian economy. In many instances, existing jobs will need to be redesigned through up-skilling or re-skilling, to meet the skills needs of individual firms and entire industries in the move towards a more sustainable future.’

The project is principally informed by the GSA’s fourth objective:

‘to implement a transition strategy to re-skill vulnerable workers.’

To address this objective, the overall project aims to identify possible opportunities for alternative employment for those workers potentially displaced by a decline in the carbon intensive industries of the Latrobe Valley. The project involves two principal phases with the following objectives:

- **Phase I** aims to identify the benchmark occupations and skill sets of workers in carbon intensive industries.
- **Phase II** will identify transition opportunities for vulnerable workers in priority industry sectors and occupations where there are significant opportunities for the nature of work and skill requirements to be transformed by carbon abatement.

A number of approaches and research activities have been (and will be) undertaken to deliver the two Phases of the project. These activities include:

**Phase I:**
- Mapping the key roles and skills (and associated demographics) of workers within carbon intensive and exposed industries
- Examining international case studies involving employment transition to seek transferable lessons for the Latrobe context

**Phase II:**
- Identifying the job and skill requirements for delivering the region’s lowest cost abatement opportunities (through the Low Carbon Growth Plan)
- Identifying transferable skills and up-skilling requirements
- Profiling the supply of, and gaps in, relevant post-secondary education in the region
- Informing current policy and program level initiatives that aim to support vulnerable workers into training and employment

The research described in this document presents the findings of the first Phase only. The work undertaken maps and analyses the current roles and skills of the power industry in the Latrobe Valley, the generator and mine workforces and those of the contractors. Based on this analysis a number of
recommendations are presented to support transition opportunities for workers within the power industry and the next stage of the research.

Phase II will develop a research program based on the methodology developed and refined for this project. It will also utilise the Phase I research outcomes and map the emerging opportunities for roles and skills that will be required for the region to implement its Low Carbon Growth Plan (Climate Works, 2011). This follow-up work will enable the matching of existing occupations and skills, as mapped in Phase 1, with new opportunities, supported by targeted training, and assist in informing a range of important Commonwealth Government, State Government and local low carbon and worker transition initiatives (see Appendix I).

The project team comprised:

- National Centre for Sustainability (NCS) at Swinburne University of Technology: Linda Condon, Scott McKenry and Tomi Winfree
- Centre for Sustainable Organisations and Work (CSOW), RMIT University: Dr Larissa Bamberry, Professor Peter Fairbrother and Dr Darryn Snell
- Centre for Global Labour Research, Cardiff University: Ms Joanne Blake and Dr Dean Stroud

The project team established a reference committee for the project to ensure that the methodology is complementary to other related State and regional initiatives. In particular, the reference committee also helped to ensure that the findings inform the Victorian Government’s Skilling the Valley initiative (see Appendix II).

The report comprises eight chapters. To begin, in chapter one, we locate the report with a discussion of the conceptual basis and methodological approach of the study. This sets the scene for the presentation and analysis of the empirical data. In chapter two, we set the Latrobe Valley in context and discuss regional employment patterns. This is followed by an organisational and labour market analysis, focusing on the power generation and related industries. Fourth, we present an analysis of the worker roles and a skills inventory in relation to the generators and mines, with a cross reference to the contract firms. Fifth, this inventory is elaborated with reference to the themes that emerge from the detailed ethnographic research that was employed in this study. In the sixth chapter, we report on comparative international case studies. The seventh chapter presents an analysis with suggestions for policy responses, which draws on the detailed research in the Valley and is supplemented and elaborated on the basis of the international comparison. In chapter eight, a set of recommendations are presented. The report ends with four appendices.

1.1 Skills: Conceptual and Methodological Approach

The primary purpose of this project is to develop an understanding of the skills profile and prospects of the power generation industry in three ways. First, the concern is with workers and where these workers will find jobs following processes of restructuring and in some cases redundancy. Second, it is important to understand the types of skills and qualifications these workers currently possess, which may (or may not) facilitate their move into new forms of employment. Third, the approach taken here seeks to understand how the skills of workers relate to the aspirations of workers, rather than focus narrowly on matching workers with employer needs. During times of employment adjustment, policies aimed at re-training, up-skilling and stimulating industry/regional development must take into account worker aspirations alongside the
potential for job growth in local labour markets. Neglect of these aspects creates situations where the current workforce is a secondary rather than the prime concern in transition and adjustment.

Many skill audits focus on how skills meet or do not meet business needs that is, the skills gap whereby an employer’s skills needs are not met by an existing workforce (for example, on these debates, see Green et al., 1998; Frogner, 2002 and Skillsmart Retail, 2004). While the needs of business have been the primary focus in much skills related research, this project builds on existing skills debates through its concern with understanding workers’ needs – understandings of workers’ skill needs, career interests and aspirations in the context of a regional economy that is predicted to undergo significant change. Working from this understanding we aim to lay the foundation for policy development that addresses two aspects of adjustment: the current position of workers so that they are involved in planning their futures, and demand for and utilisation of skills by employers. Minimising the hardship and disruption to working lives and households is therefore an important aspect.

Conceptually it is important to distinguish between skills gaps and skills shortages: skills gaps are defined as the deficiencies employees need to carry out their existing tasks (Green et al., 1998) whilst skills shortages are defined as deficiencies within the labour pool, which in turn create problems in recruiting new staff, that is there is a shortage of individuals with the required skills in the accessible labour market (Frogner, 2002, p. 18). In addition, it is worth noting that there may be skills shortages where the current workforce does not have skills that an employer believes will be necessary in future, if the business is to develop (Skillsmart Retail, 2004). These distinctions should be kept in mind in discussions about skills.

The focus of the current research thus becomes one where the central concern is the workforce, where potential displaced workers will find jobs, the types of skills and qualifications they have, their experience in the labour market and their aspirations in relation to employment and work. This focus leads to an approach that seeks to understand the skills of workers and how they relate to the aspirations of workers in a situation where jobs disappear or are drastically reduced, rather than the needs and aspirations of employers. This approach ensures workers who are likely to be affected by changes in the regional economy are engaged in the process of planning for their future. It will result in a comprehensive and focused analysis of skills and needs in the industry, thereby making possible informed policy making to support a positive transition.

During times of significant industrial and employment change re-training and up-skilling and industry/regional development policy has to take into account both worker aspirations and local industry and job growth realities/potentials, as well as the situation and concerns of employers outside the industry (the latter point being one that is beyond the remit of this particular research project). In other words, in the consideration of skills, attention should be given to both supply and demand. The dominant narrative over the last few decades and in particular in the Latrobe Valley region has been on supply (e.g. Buchan Consulting, 2005); there has been a relative neglect of demand, and in particular the consideration of demand for and utilisation of skills (Buchanan et al., 2010 and Payne and Keep, 2011). This project focuses on one aspect of this more integrated analysis, that of skills utilisation, both by current employers and potentially by others.

The project also seeks to understand the ways in which workers address change, in relation to their age, gender, skills and qualification levels. It considers training, skills levels, career intentions and assistance that is most appropriate for workers to meet their career aspirations and to adjust to a changing job and labour market. The research methodology is designed to build a knowledge base about these issues, informed by worker representatives and workers’ input via in-depth interviews and related data, as well as understandings and approaches to skill acquisition and
retention by employers. This knowledge establishes the basis for additional research to inform the development of a transitional workforce development strategy for the industry and the region.

**Understanding Skills**

The debates about skill are complex. Two aspects are important for this study. First, there has been considerable debate about the definition of skills in the context of the social relations that define work and employment. Second, these debates have implications for the ways in which research is done. One of the difficulties in discussing skills is that there are a number competing conceptual frameworks that have been used to define skills (e.g. Stasz, 2001; Spenner, 1990; Vallas, 1990; Green and Ashton, 1992). These frameworks are rooted in the changes that are taking place in work and employment relations over the last few decades. This interest is associated with recognition that in the context of change, it is also necessary to consider the skills profiles of workforces with reference to recruitment, retention, employability and work output. Such an approach promotes an analysis in terms of the skills gap. Commentators point to a range of changes that are taking place in relation to work and employment with implications for skills deficits and requirements: technological change, managerial reorganisation and focus, the reorganisation of work processes, and the internationalisation of product chains and markets (Stasz, 2001; and Vallas, 1990). Based on such analyses, policy makers have proposed ‘new’ skills frameworks (Stasz, 2001: 385). Further, these researchers have stimulated skills theorists to debate the meaning of skills in the current economic order (Vallas, 1990).

In contrast, this research project proposes a political economy approach to a skills analysis. The starting point for our analysis is to consider the interrelationship between corporate reorganisation, the changing labour market, the specificities of a sector and its interaction with local and national government institutions, regulations and policies, and the prospects for transition. The first task in addressing this theme is to ask ‘what is a skill? It is important to consider how skill is shaped and determined?’ and then to ask ‘what are the changing requirements for skills and for whom?’ This second question raises questions of agency, influence and trajectory. The aim is to lay the foundation for the analysis that informs the project.

**What is a Skill?**

There is a long-standing debate about the nature and character of skill. In general, skill has been defined in terms of practical abilities, cleverness and dexterity and/or as an attribute requiring knowledge, coupled with readiness and dexterity. Following on from this broad perspective, questions arise as to whether skill is innate - a practical ability and cleverness that exists within the individual mind - or whether it is outside the individual and recognisable as an acquired knowledge and/or ability.

In a very useful account on skills and work, Stasz (2001) identifies four broad skill areas:

1. Academic or competence skills: knowledge about broad subject areas;
2.Generic skills: problem solving, communications or working in teams;
3. Technical skills: specific skills needed in an occupation; and
4. Work related skills: motivation, volition and dispositions
   (Stasz, 2001: 386)

These differing areas indicate the complexity that is involved in defining skill. Other commentators have drawn attention to similar ranges of skills areas (Spenner, 1990; Vallas, 1990). The important point that arises from this consideration is that while analytic distinctions can be made about different types of skill, it is likely to be the case that there is a complex inter-relationship between...
these areas of skill, in any particular industry or occupation. We have kept these distinctions in mind when carrying out the study of the skills profile in the power industry.

It seems most useful to discuss skill as a process of learning (see Fuller and Unwin, 2004 and Ashton, 2004). This definition takes skill to be an acquired knowledge. In this way, it is possible to link the acquisition of skill with the training and learning processes (both formal and informal). This relationship is most evident in the way that workers are categorised as skilled, semi-skilled or unskilled (for a discursive discussion on these features, see Penn, 1999). Skilled workers are more generally considered to be ‘craftsmen’ [sic], whose training (or learning) is spread over a significant period of years. Semi-skilled workers require a more limited period of training and unskilled workers no formal training whatsoever (Woodward 1965).

Skill definitions have been constructed over decades, and are often rooted in negotiations between employers and workers (usually via trade unions). In this respect, it could be argued that there is a social basis to skill definition that distinguishes between different social groupings in workforces, according to designated criteria. This recognition may be linked to qualifications; it may also implicitly be linked to gendered definitions of work and work relations, so that traditionally the skills acquired by women workers are often valued less (in the form of wage levels) than those acquired by men (Penn, 1999). Such distinctions may be used to justify the distinctions and segregations that are often evident among workforces.

This understanding might be extended to include understandings of skill and skilled work as subject to the strength of occupational groups to protect a real technical skill that produces demonstrable results (Collins 1979: 132-3). Cockburn, in particular, in a number of studies has argued that historically in industries such as print, trade unions have played a key role in ensuring women could not be employed to traditionally male occupations. This was the case even when the character of the job changed in terms of skill content and what was traditionally thought of as men’s work (Cockburn, 1983 and 1991). In this respect, the gendered construction of skill and indeed occupations is informed by patriarchal assumptions about work and employment. These aspects are then reflected in the labour market where distinctions are made between male and female jobs and skills. In other words, occupational groups might defend (or hide) the content of a skill to maintain the status and standing of practices.

In the same way the status and standing of a skill might also be monopolised by controlling who will be trained (Collins 1979). In this regard, there may be an

‘…artificial delimitation of certain work as skilled, the purpose of this delimitation being the reservation of certain kinds of work for those who have also acquired the label ‘skilled’, thus ensuring for them high wages, better chances of employment or some other advantage.’

(More 1982: 109)

Nonetheless, it is important to remember that skill is also a category that has real content (knowledge/ability), even if in some respects the content of skill is sometimes ambiguous and difficult to define. Perhaps one of the most reliable ways of measuring, or at least one of the most acceptable and recognisable ways of defining skill, is through qualifications. As such, qualifications may act as a proxy measure for skill and denote something about skills that are acquired through ‘learning’.
Changing skill requirements

Skill recognition is often equated with formal qualifications and credentials. One consequence may be that such formal recognition may encourage simplistic and de-contextualised conclusions to be drawn about an individual’s competencies and abilities (Fuller and Unwin, 1999). More benignly, however, qualifications can be considered as a proxy form of skill recognition and used as such. Nonetheless, it should be remembered that it is not always possible to read actual skills levels from the qualifications attained by an individual or indeed the qualifications required for a particular job or grade of work. In view of these complexities it is necessary to be cautious when referring to qualifications in relation to skills. This caution applies in particular to policy development and policy implementation as well as to workers’ aspirations and experience (on the importance of this point, see Wolf Report, 2011).

Traditionally, the power industry has been organised in terms of a layered set of skill gradations, ranging from unskilled labourers, to operators and to staff, principally qualified engineering and technical staff. However, over the last two decades this conventional picture has been qualified, following technological change and innovation and the increased marketisation of the industry, a feature of many traditional industries, such as steel. More often than not, this means an increasing demand for more highly qualified individuals. However, in the power industry the number of workers without any specific qualifications comprises a high proportion of personnel. Qualifications held do not necessarily indicate, except indirectly and with possible inaccuracy, the skills demanded at work, as demonstrated in the skills inventory in chapter 4 below. Indeed, not only does this approach have implications for training and learning within the power industry – both in terms of skills within the industry or transferable skills – but it also signals a failure to grasp the complexity of what ‘skill’ is and what it actually means to be ‘skilled’. These matters must be fully acknowledged when developing an appropriate workforce transition strategy.

Indeed, it might be that the skills profile of power workers is severely underestimated, simply because as a group of workers they lack formal credentials. A ‘credentialist’ perspective of power workers’ skills fails to properly contextualize a workforce’s skills profile. For instance, older workers’ skills might not be credentialed in a formal way, even though they might be highly skilled individuals who may be expected to provide mentoring and skills development assistance to less experienced workers. Moreover, extensive work place training does not always result in formal qualifications. Thus, it is difficult to measure power workers’ skills and competencies. Indeed, it is perhaps more useful to consider how skills and credentials – especially those acquired through in-house training - that are particular to specific industries, might be formally recognised and acknowledged by employers more widely.

Towards a Political Economy of Skills

In assessing and evaluating skills profiles, two broad approaches are evident: an economic approach and a socio-cultural one (Stasz, 2001; also see Spenner, 1990 and Vallas, 1990).

- **Economic view of skills**: ‘an attribute that is amenable to quantitative measurement and has objective character independent of the observer’ (Stasz, 2001: 387). This perspective matches ‘skills’ with job descriptions (an analysis of tasks to develop entry tests), defining discrete sets of skills to match jobs.

- **Socio-cultural view of skills**: ‘shifts the focus of enquiry from individuals to interactive systems or social settings that are larger than the behaviour and cognitive processes of a single person’ (Stasz, 2001: 387). These social settings are broader than the behaviour/cognitive process of one person. The assumption is that the social setting is integral to skill formation and
acquisition, and not just a context for skill. Socio-cultural understandings raise serious questions about trying to understand skills from an ‘economic’ perspective. This is because workers in situ might use unconventional methods (skills) to complete tasks (e.g. judgement of capacities instead of maths). Such studies question the value of credentials since credentials indicate what performance might be like, although this is often less important than working knowledge (experience). These approaches relate to specific situations, practices, jobs, work groups, organisational arrangements and combined with broader understanding and information.

The important point to note about these research perspectives and methods is that they yield different kinds of evidence about skills.

Our approach builds upon the developing political economy of skills framework (see Brown, 1999; Buchannan et al., 2001; Crouch et al., 1999; Lloyd and Payne, 2002). This approach goes beyond the narrow focus on the skills gap, that is, skills that are not met within a current workforce, which rests on an assumption that skills will be, and should be, determined by business interests and concerns. An understanding of skill formation and skill transition challenges during structural change in this broader approach includes an understanding of both the specific socio-economic contexts in which skills are embedded and the dynamics that underpin them.

Finegold’s (1999) conception of ‘skill ecosystem’ in which skills are reproduced in spatially bounded and context-specific labour markets is a useful starting point. Buchanan and colleagues (2001), expanded upon this framework in their regional labour market research in Australia. They define skill ecosystems as ‘clusters of high, intermediate or low-level competencies in a particular region of industry shaped by interlocking networks of firms, markets and institutions’ (p. 21). They posit that skill ecosystems are shaped by a range of social forces including business settings and networks, institutional and policy frameworks (including Vocational Education and Training – VET – and industry specific policies), ways of training and engaging labour, and the particularities of job design and work organisation.

Our political economy approach takes into account the relationship between the organisational characteristics of the industry, the context in which it is situated, skill formation and skill utilisation. The project conceptualizes the power industry and its workforce as one shaped by the organizational practices of the network organisation (see Castells, 1996) or ‘flexible firm’ (see Atkinson and Gregory, 1986). The networked organisation is one where lead firms— in this case the generators— rely upon an array of other firms to realize both short and long-term goals. Networked organisations are often the product of outsourcing strategies by lead firms as a way to address organizational weaknesses (e.g. lack of technological capacity and/or expertise, high capital and labour costs, and so forth) as well as ways of strengthening their core activities.

For the purposes of this research, we begin from the premise that the Latrobe Valley power generation industry is comprised of four components with different types of organisations. First, are the lead firms represented by the generators. Second, are the continuous presence contractors (CPCs) whose business activity is aligned with the needs of the lead firm. In a couple of cases, these CPCs operate as alliance contractors whose profits are tied to the economic fortunes of the generators. The third component consists of a diverse grouping of independent contractors who typically rely upon procuring tender contracts with the lead firm (i.e. generators) which may or may not be on fixed-price arrangements. The fourth component consists of a variety of sub-contractors that provide services to CPCs and/or independent contractors. The methodology is informed by this particular organisational form as a way to better understand the nuances and specific skills found within organisations located within different components of the ‘flexible organisational network’.
The research recognizes that worker experiences and employer expectations and strategies are differentiated by their location within the disaggregated industry. The disaggregated nature of the industry contribute to differentiated internal labour markets, involving core and peripheral workers, with major implications for the nature of skills, skill formation and remuneration within the various components of the industry.

In presenting a holistic people focused approach to a skills analysis we draw upon the notable work of Lloyd and Payne (2002). They remind us of the agency of powerful actors—government, employers and trade unions—their competing and vested interests and the ways their interaction shape skill formation and workforce developments. Skill and training requirements, the breadth and depth of training, credentialing and the formal recognition of skills, re-training and transferability of skills, along with remuneration for particular skills, are often deeply contested matters. Such interests and differences point to the limitations and possibilities for skill trajectory development and change (see also Brown, 1999, see also Brown et al., 2010). Politically negotiated outcomes and solutions achieved through such a complex and contested socio-political dynamic complicate the policy making and transition process. Drawing upon such an understanding, this report highlights the ways power relations within firms (employers and trade unions principally) and between firms, in conjunction with national, state and local institutional and regulatory arrangements, have shaped the development of skills and forms of work in the electricity generation industry. It is argued that definitions of skill and the skills associated with the electricity generation industry should be understood as occurring through these contested and negotiated social and political processes. The report equally acknowledges that the transition to a low carbon economy and the skill requirements needed for such a transition will also involve such processes. ‘Locating issues of class, conflict and power at the centre of the skills debate’ as Lloyd and Payne (2002) point out, ‘forces a confrontation with the nature and scale of the political challenges that surround any project that realistically aims to shift the economy’ (384). The recommendations put forward at the end of this report are sensitive to these political realities and challenges. Policy makers must be aware of the tensions and clashes that may be involved and at no point rely on only one principal source of information.

Unlike other approaches to skills analysis, which tend to overwhelmingly focus on concerns about skills shortages and improving the supply of skills, this report places workers and their skills at the forefront of the analysis. It focuses on the relationship between the skills possessed by workers and skills required by workers to undertake tasks. This approach aims to provide governments and other social actors an improved understanding of the skills and work experiences of these workers so they can better assist them during an adjustment period. Our approach is to develop a political economy of skills that links job transition and growth with skills defined as understanding workers’ needs, their skills, their career interests and aspirations. In this respect, the approach should be assessed as an exploratory methodology, opening up issues, not only for job growth strategies but also for education and learning development.

1.2 The approach taken

Given the complexity of the power generation industry within the Latrobe Valley, a number of methods have been used to collect the quantitative and qualitative data that informs the project. The report draws on the statistical analysis of data, document analysis, literature review, consultation and interviews.

To provide a broad understanding of the demographic and socioeconomic structure of the region, the team drew on a range of Australian Bureau of Statistics (ABS) collections including current and time series data from the labour force survey and the 2006 Census, with some information from
the 2011 Census. The 2006 Census data was also used to provide in-depth analysis of the power industry within the Latrobe Valley region, including the size of the industry, the age, gender and occupational structure of the industry, and the educational levels and post-school qualifications within the industry. Census data also informed the analysis of household composition and the proportion of household income generated by individual incomes from within the power industry.

Document analysis, consultation and focused interviews were used to undertake the skills inventory of power generation workers. Power generators provided de-identified job descriptions of key occupations within their organisations. These documents provided the broad details of the skills and knowledge, as well as the relevant education and training required for each occupation. The skills, knowledge and educational attainment were mapped against existing educational and training opportunities currently provided in the Latrobe Valley region and across Australia.

The international review of literature involved the collection, collation, summarisation and synthesis of existing primary research and evidence from research reports and publications. Principally, this involved searches of pertinent journals, searches of government and organisation websites (e.g., OECD, CEDEFOP) and numerous internet searches involving a range of search engines, both generic (e.g., Google) and discipline specific (e.g. ERIC, Environment Abstracts) to identify where such transitions had taken place and whether these transitions had appropriate lessons for the Latrobe Valley region.

The statistical analysis, document analysis and international literature review provided the framework for the collection of the qualitative data. The qualitative data was collected through consultation and in-depth interviews with a range of stakeholders and informants. These included:

Management representatives of the power generators
Key personnel from continuous presence contractors
Key personnel from independent contractors
Individual contractors
Employees from all types of employers across the sector, including power generators, continuous presence and independent contractors
Union representatives for a number of unions engaged within the broader power generation sector (See Appendix 3 for more detail).

Interviews were conducted either in the workplace or in neutral locations outside the workplace where appropriate. Interviews ranged from 20 minutes to 1.5 hours and covered a range of topics specific to the role of the participant (See Appendix 4 for more detail). Interviews were recorded and transcribed; all identifying material has been removed. Following the completion of the draft report, a further round of consultation with key stakeholders and the reference committee members took place to ensure that there are no errors of fact or misrepresentation of information.

**Key points (research methodology):**

1. The central concern of our research is the workforce, where potential displaced workers will find jobs, the types of skills and qualifications they have, their experience in the labour market and their aspirations in relation to employment and work.

2. The approach adopted here is one that presents a political economy of skills acquisition, skills recognition and the transition of skills in a changing world. Skills are defined here as encompassing workers’ needs, their technical skills, their career interests and aspirations. This approach goes beyond the narrow focus on the ‘skills gap’ which focus on concerns
about skills shortages and improving the supply of skills.

3. The research also recognises that in the power industry the number of workers without any specific qualifications comprises a high proportion of personnel but the uncredentialed skills profile of power workers may be severely underestimated.

4. Our research methodology was informed by the premise that the Latrobe Valley power generation industry is comprised of four components with different types of organisations. The four components are the lead firms represented by the generators; the continuous presence contractors (CPCs); the diverse grouping of independent contractors; and finally, a variety of sub-contractors that provide services to CPCs and/or independent contractors.

5. Given the complexity of the power generation industry within the Latrobe Valley, a number of methods have been used to collect the quantitative and qualitative data that informs the project. Our approach draws on the statistical analysis of data, document analysis, literature review, consultation and interviews.
2. Latrobe Valley in Context

Latrobe City evolved from the former Latrobe Shire on 6 April 2000 bringing together four major centres (Moe, Morwell, Traralgon and Churchill) and several smaller towns. Located 135 km east of Melbourne in the Statistical Division (SD) of Gippsland, Latrobe City's natural features include Morwell National Park and the Latrobe River. Latrobe City's resources of forest timber, brown coal, water and agricultural land make it the primary service centre for the Gippsland region.

2.1 The Area

Given that the region is resource rich with four major energy generators located in areas adjacent to the major centres, making better use of less carbon-intensive fuels and alternative energy initiatives will have significant implications for the future of the Latrobe Valley. In order to understand the future prospects of the region, it is necessary to have a clear picture of Latrobe City today.

Latrobe has a mixed history, with most of the twentieth century marked by the expansion and relative prosperity associated with the State Electricity Commission, Victoria (SECV) and its core activities in the Latrobe Valley. With the privatisation of the SECV in the 1990s, the area experienced a major upheaval leaving its mark into the current period. Nonetheless, the City remains an important hub for employment and related economic activity in the region.

The stable economy in the Latrobe Valley of the past was transformed in the 1990s with the privatisation and restructuring of the power industry. The ownership of the industry was taken over by international companies and this followed major job losses in the order of approximately 5000 jobs lost from a workforce of 8,500 (Kazakevitch et al., 1997; Birrell, 2001). This extensive job loss transformed the Valley into one of the most disadvantaged regions in Victoria by most social and economic indicators.
The Valley’s external identity, according to one commentary, was transformed by these events:

‘Perceptions that it was a poverty trap for a provincial underclass were highlighted when low-rent housing was used to house welfare dependants— anecdotally, at least, single mothers with boyfriend … an unfair perception that “the Valley” was an economic and social morass, a place of polluted air and broken homes, broken hearts and broken dreams. It is a perception that still lingers in the outside world.’

(The Age, 23 September 2008; see also Fletcher, 2002: 219-222)

Despite this restructuring, power generators in the Latrobe Valley continue to supply 80-90 per cent of Victoria’s electricity. According to research commissioned by Latrobe City Council, the industry provides economic value-added revenue estimated at $802.4m in 2008, representing 21.2 per cent of gross regional product, while every ten direct jobs in the coal and electricity sector were estimated to sustain a further eight jobs in the local economy (Latrobe City Council, 2009).

Other major industries include timber processing, and the manufacturing of paper products as well as the provision of services to the Gippsland region through local government. More recently, Latrobe has developed other sectors such as information technology, eco-tourism and research and development. Latrobe City also hosts a number of important educational facilities such as Monash University, Advance TAFE (formerly East Gippsland TAFE), Central Gippsland Institute of TAFE and Apprenticeships Group Australia.

2.2 Relative disadvantage

The Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Disadvantage was used to compare Latrobe City to other LGAs. This index focuses primarily on disadvantage and is derived from 2006 Census variables such as income, educational attainment, unemployment, and dwellings without motor vehicles (ABS cat no. 2033.0.55.001). Using this index, areas of greatest disadvantage have the lowest scores. Latrobe City was in the first decile and ranked 8 in a total of 79 Victorian LGAs, so can be considered relatively disadvantaged.

The SEIFA index varies across Latrobe City, with pockets of relatively higher disadvantage within the townships of Traralgon, Morwell, Churchill and Moe (see Figure 2).
2.3 The Latrobe Valley and Regional Employment Patterns

According to the 2006 census the total population of the Latrobe City Local Government Area (LGA) was 69,331 (ABS, 2006). The age and sex structure of the population of the region is broadly similar to that of Australia, reflecting the general pattern of women’s greater longevity and the trend towards lower fertility rates. There is an ageing population in Latrobe City, as is the case in Australia generally, however, ‘residents of Latrobe City experience a below average life expectancy, in comparison with the Victorian average’ (Latrobe City 2005, 19).

Given that the LGAs of Baw Baw and Wellington are within close proximity of Latrobe City and a significant proportion of workers from these LGAs are employed in the Latrobe City LGA, it is important to include all three LGAs in our analysis of the power generation workforce. We utilise the name Latrobe Valley region to signify the inclusion of all three LGAs, and the name Latrobe City to signify the single LGA. The population of these three LGAs was 146,587 (ABS 2006).

Amongst the total population of the Latrobe Valley region, 66,707 people were in the labour force, a labour force participation rate of 61 percent which is somewhat lower than participation rates across Australia (65 percent) (ABS 2006). Since 2006, Labour Force data shows that the Gippsland statistical region has generally had a lower participation rate than the average across Victoria, although this has been reversed in the past two years (ABS 2011).

![Figure 3 – Labour force participation rates Gippsland Statistical Region and Victoria](labour_force_graph.png)

Source: ABS 2011 *Labour Force Australia*
Over the same period, the Gippsland region has had lower unemployment rates than across Victoria more generally. A higher than average participation rate in combination with low unemployment rates could imply that the ageing workforce is having an impact on the labour market. The large increase in participation rates for women in the last two years may have been driven by heightened financial concerns in the area, the uncertain future of the power industry, a more general anxiety about incomes and mortgages, activity around the GFC and the adverse speculation about the impact of the introduction of a carbon tax. The increase may also be due to a more positive outlook in the region with increasing job opportunities emerging.

There is also a high level of seasonal variability in the Gippsland unemployment rates, suggesting the existence of highly contingent employment patterns with workers moving in and out of employment in relation to seasonal demand, short-term contracts and casual appointments. The seasonal variation is contributed to by agriculture such as fruit picking, tourism which peaks at regular intervals throughout the year, and the varying needs of the power industry itself. The volatility in unemployment rates is experience by both men and women within the region (ABS 2011).

2.4 Change drivers – federal, state and local policies and initiatives

The implications of government policy and programs from all levels of government on the power industry in particular are potentially wide ranging. It includes measures to initiate change, support a targeted process of change and provide for a range of opportunities including structural adjustment in those regions affected. This section outlines many of the policies and programs which are driving the change to a cleaner energy future.
Commonwealth government policy

- **Securing a Clean Energy Future**: the Australian Government climate change plan. The legislative Package includes the carbon pricing mechanism and delivers support for jobs and competitiveness and Australian’s economic growth, while reducing pollution. Households will be assisted through tax reform and increased payments (Australian Government, 2011).

- **Contracts for Closure**: The Commonwealth government has asked generators to lodge EOI for retirement of coal fired power stations. The Commonwealth has committed to reducing Australia’s carbon emissions by between 5 and 25 per cent from 2000 levels by 2020, depending on the scale of global action. The Commonwealth has also adopted a new long-term target of reducing Australia’s carbon emissions by 80 per cent from 2000 levels by 2050. On 10 July 2011, the Commonwealth announced its Clean Energy Future (CEF) Package (Australian Government 2011). The CEF Package has four pillars: a carbon price, renewable energy, energy efficiency and action on land. The CEF Package also details how the Commonwealth will support Australian households, businesses and communities to transition to a clean energy future. Transforming Australia’s energy sector from high emissions-intensity electricity generation to cleaner forms of electricity generation is a central element of the CEF Package. The objectives of the CFC Program are to:

  o negotiate the orderly exit, by 2020, of around 2,000 MW of highly emissions-intensive coal-fired electricity generation capacity;
  o provide certainty about the timing of closure of this highly emissions-intensive coal-fired electricity generation capacity and provide sufficient time to facilitate investment in replacement lower emissions electricity generation capacity;
  o minimise the risks to energy security that may arise from an unplanned exit of electricity generation capacity from the market;
  o achieve a value for money outcome on terms and conditions that are acceptable to the Commonwealth; and
  o ensure that appropriate arrangements are put in place by Eligible Generators to preserve workers’ entitlements and meet all relevant State legal requirements, including requirements regarding site remediation.

- **$200 Million Regional Structural Adjustment Fund**: A central element in the Australian approach to economic reform over the past three decades has been structural adjustment assistance. The Commonwealth will maintain this approach under the clean energy plan to help to ease the transition for strongly affected regions and communities. The $200 million Regional Structural Assistance Package will be set aside for structural adjustment assistance for regions and communities, and if required there will be other initiatives which assist strongly affected areas and sectors.

- **National Framework for Energy Efficiency**: In 2004, the Ministerial Council on Energy agreed the first stage of the National Framework for Energy Efficiency (NFEE). In 2007, Ministers agreed to the second stage of NFEE, including five new energy efficiency measures for delivery (DRET website). In July 2009 the Council of Australian Governments, signed the National Partnership Agreement on Energy Efficiency, which encompasses:
o assistance to households to reduce energy use by providing information and advice, financial assistance and demonstration programs;
o assistance to business and industry to obtain the knowledge, skills and capacity to pursue cost-effective energy efficiency opportunities and meet the challenges of a low carbon economy;
o higher energy efficiency standards to deliver substantial growth in the number of highly energy efficient homes and buildings, and provide a road map to assist Australia’s residential and commercial building sector to adapt;
o nationally-consistent energy efficiency standards for appliances and equipment and a process to enable industry to adjust to increasing standards over time;
o introducing new standards for the energy performance of air conditioners;
o addressing potential regulatory impediments to the take up of demand side initiatives and smart grid technologies;
o governments working in partnership to improve the energy efficiency of their own buildings and operations; and
o a detailed assessment of possible vehicle efficiency measures, such as carbon emission standards.

- **Clean Business Australia:** Three programs to improve energy efficiency (www.ausindustry.gov.au):
o Climate Ready, which helps small and medium sized Australian businesses to develop new technologies and services responding to climate change;
o Re-tooling for climate change, which supports small and medium sized Australian manufacturers to reduce their environmental footprint; and
o Green Building Fund, which supports owners of existing commercial office buildings to reduce their energy consumption and emissions.

- **Clean Energy Initiative:** The Clean Energy Initiative complements the Renewable Energy Target by supporting the research, development and demonstration of low-emission energy technologies. The initiative includes the Carbon Capture and Storage Flagships Program, the Solar Flagships Program, the Australian Solar Institute and the Australian Centre for Renewable Energy. Under the ‘Securing a Clean Energy Future’ these programs would be administered by a new organisation, the Australian Renewable Energy Agency.

- **The Carbon Farming Initiative:** The Carbon Farming Initiative (CFI) is a carbon offset scheme, which will allow farmers, forest growers and landholders to sell credits for carbon abatement. The scheme’s enabling legislation, the Carbon Credits (Carbon Farming Initiative) Bill 2011 has recently passed the Australian Parliament (Department of Agriculture, Fisheries and Forestry, 2012).

- Skills for carbon abatement including the COAG Green Skills Agreement and streams of work associated with its objectives; Living Sustainably: the Australian Government’s National Action Plan for Education for Sustainability; and the ‘Clean Energy Skills Fund’ announced in the recent Securing a Clean Energy Future package.

**State policy**

- **The Latrobe Valley Advantage Fund**
The Fund was created to meet the initial adjustment needs of the Gippsland region in transitioning to a low carbon economy. Its primary objective is to leverage more private
sector investment and create new jobs through the provision of enabling infrastructure. The Fund focuses on three key areas:

- skills and training (Skilling the Valley);
- sustainable energy research and development; and
- jobs and industry.

A number of initiatives are being implemented under the Fund, including the development of a Low Carbon Growth Plan for Gippsland; $10 million for the Industry and Jobs Fund; $5 million for renewable energy development; and an industry prospectus.

- The Skilling the Valley suite of initiatives ($10m) is as follows:
  
  - **State of the Valley Report**: This report reviews and synthesises information from more than 60 sources to provide a ‘snapshot’ of the Latrobe Valley and an evidence base for the Latrobe Valley Industry and Employment Roadmap. It includes information on the region’s population, economy and local industries, its workforce, education and training in the region and community health and wellbeing. It also provides an overview of initiatives already in place. The report identifies the challenges and potential opportunities facing the region. It makes recommendations to be considered in the development of the Roadmap, including recommendations for further research to provide a more detailed picture of the likely impact of key issues.

  - **Strong Foundations for Gippsland**: Strong Foundations for Gippsland ensures that every Gippsland resident has the necessary foundation level skills to participate in the modern economy. Coordinated action is being undertaken by Central Gippsland Institute of TAFE, East Gippsland Institute of TAFE, and all RTOs and ACE providers, to provide foundation level skills in literacy, numeracy, language and work skills.

  - **Industry Link Officers**: The Victorian Government has provided funding of $1.15 million for four new Industry Link Officers to link employers, government, labour groups and education providers and to build long-term skill and training strategies for the Latrobe Valley. These positions are located in the Gippsland Education Precinct, VECCI, the Gippsland Trades and Labour Council, and Latrobe City Council.

  - **Eligibility exemption places**: The Victorian Government has provided funding for three hundred eligibility exemption places to provide government subsidised training places to workers who may not otherwise be eligible. This ensures that every worker impacted by a company restructure, closure or retrenchments is able to access appropriate government subsidised training for re-deployment or re-employment. The eligibility exemption places are being provided over the years 2011 to 2013, with 80 places available in 2011, 110 in 2012 and a further 110 places in 2013.

  - **Preparing for the Future**: This initiative involves a scoping exercise to identify opportunities to up skill workers likely to be impacted by changes in the region, either through scholarship programs or training in Specialist Centre Networks located at TAFE Institutes in the region. These include the Special Energy Network based at the Central Gippsland Institute of TAFE, the Centre for Sustainable Water Management at Chisholm Institute, and the Specialist Advanced Manufacturing Network at Swinburne University (TAFE Division). This could provide opportunities for affected workers to access specialist training in emerging areas of low carbon and ‘green’ industry
applications and provide significant engagement opportunities for each of the Specialist Centre Networks.

- **Worker Engagement**: A survey will be conducted of workers employed in industries most likely to be impacted by the transition to a low carbon economy. It will determine their age, gender, qualification level, last engagement with formal education, career intentions and career interests. This information will inform the development of a transitional workforce development strategy which engages these workers in planning for their future.

- **Workers in Transition**: The Workers in Transition Program is one of the only state-wide government responses to company restructure or closure and retrenchments. The Program helps workers facing retrenchment to transition to alternative employment through the provision of appropriate training.

- These initiatives are all being implemented to leverage opportunities available under the Victorian Training Guarantee, which makes vocational education and training more accessible to people who do not have a post-school qualification, or who want to gain a higher level qualification than they already hold.

- **Latrobe Valley Industry and Employment Roadmap** - The $5 million Latrobe Valley Industry and Employment Roadmap is the Victorian State Government’s commitment that aims to develop a long-term plan for future industry and employment development. The funding was announced in December 2010 as part of the election commitments by the relatively recently elected Baillieu State Government. The initiative will build on the $30 million Latrobe Valley Advantage Fund to deliver a clear and achievable plan for new industry and investment and secure long-term employment for the Latrobe Valley. In recognition of the current and future challenges the region faces in relation to national climate change policy development, the Roadmap will build on existing local and regional economic plans and strategies:

  - link up work across new regional development projects
  - strengthen networks between State departments and the region’s local governments and local institutions
  - identify more opportunities for new industry and leveraging more investment locally.

The Roadmap is being developed to support local communities and industry in meeting current and future challenges by creating local jobs, attracting new industries and investment and developing new technologies to reduce carbon emissions. **Skilling the Valley and the Roadmap**, are the outcomes of an important partnership between governments, employers, education and training providers, business and community.

- **The Tertiary Education Plan for the Gippsland region** – The State Government established Government established an expert panel to develop a Tertiary Education Plan for Gippsland. The review was chaired by Professor Kwong Lee Dow, a former Vice-Chancellor of the University of Melbourne, who was joined on the panel by Dr Michele Allan and Mr John Mitchell. The plan follows Skills Victoria’s 2009 report advising on the development of the Victorian Tertiary Education Plan which confirmed there was an appreciable gap in participation and attainment levels between large parts of Melbourne and regional Victoria (Dow et al., 2011).
• **Building standards** - The Victorian Government has endorsed the national agreement requiring that new and significantly renovated residential and commercial buildings meet six star minimum energy efficiency standards. There is bi-partisan support for all existing housing stock to meet a 5 star energy rating on average.

• **Victorian Energy Efficiency Target** - The Victorian Energy Efficiency Target Scheme (VEET) is a certificate based scheme that requires Victorian energy retailers to improve energy efficiency. The Essential Services Commission administers the scheme. VEET allocates certificates for energy efficiency improvements undertaken by households. Energy retailers are obliged to supply households with energy efficiency technologies or buy certificates. The scheme is currently subject to a regulatory impact process.

• **Energy Technology Innovation Strategy** - The objective of the Victorian Government's Energy Technology Innovation Strategy is to lower the cost of prospective sustainable energy technologies. The strategy seeks to have these technologies available to assist the transition to a low carbon economy.

• **Environment and Resources Efficiency Plans** - Environment and Resource Efficiency Plans are a Victorian regulatory requirement targeting large energy and water users. Businesses subject to a plan are required to implement actions that achieve environmental benefits and which have a financial payback of three years or less.

• **Feed in tariffs** - The Victorian feed in tariff is available for those generating up to 100 kilowatts of clean electricity from wind, solar, hydro and biomass sources. Eligible customers receive a payment for any excess electricity they feed back into the state’s electricity grid. The Minister for Energy and Resources has announced that it will introduce a new transitional feed in tariff for properties installing rooftop solar panels to replace the current premium feed in tariff, which will soon reach its statutory capacity of 100 megawatts. The transitional arrangement is in place pending a review of feed in tariffs to be carried out by the Victorian Competition and Efficiency Commission, which will report in 2012.

• **New Wind farm regulations** introduced in Victoria in 2011 mean that:
  - Wind farms will be prohibited in areas including along the Great Ocean Road, Mornington Peninsula, Macedon and Yarra Ranges and Wilsons Promontory.
  - Construction of wind turbines within two kilometres of houses cannot proceed without the consent of the owner of the home.
  - Construction of wind turbines within five kilometres of major regional centres will not be approved.

**Local Initiatives**
Local initiatives have developed over the past few years and now represent a significant number of organisations and projects with either links to local government, state government, universities /TAFE and to the community. A full listing can be found in the report produced by the Gippsland Climate Change Network (see Appendix 1).

• Gippsland Climate Change and Low Carbon Transition Groups and Activities Map
• Activity in Gippsland’s Climate Change and Low Carbon Transition Sector, Latrobe City, Gippsland Climate Change Network, Department of Sustainability & Environment, Apr 2011
• Gippsland Centre for Sustainable Technologies, A Priority of the Gippsland Regional Plan 2010: Enabling the transition of the regional economy to meet the challenge of a carbon constrained world, Monash University Gippsland and the Gippsland Regional Plan
• Gippsland Low Carbon Economy Transition Plan, Position Paper, Gippsland Local Government Network
• Clean Coal Victoria – established by DPI to develop ways of utilising Victoria’s coal resources to reduce carbon pollution.

2.4 Summary and Key Findings

These drivers of change are comprehensive in their focus and involve all levels of government. The prospect of the closure of at least one power generator, as well as the moves to promote a transition to a low carbon economy, provide an impetus to consider the skills profile and possibilities in the region. This region, however, is marked by relative disadvantage when compared with other regions in Australia.

Key findings:

1. The Latrobe Valley region comprises three local government authorities, Latrobe City, Wellington Shire and Baw Baw Shire, and economically they are inter-linked. Power generation is a major industry and brown coal constitutes a significant resource for the region and the State as a whole.
2. The region is an area of relative disadvantage.
3. Employment patterns are:
   a. Labour force participation is lower than the Australian average.
   b. Over the last two years (2010 and 2011) participation rates have increased because of an increase in women’s participation rates and unemployment rates have declined.
   c. Factors to consider – aging workforce; financial anxiety; possible job opportunities; and seasonal variability.
4. With industrial decline following the period of privatisation, and continued uncertainty about the future of the power generation industry, governments have commissioned enquiries, published policy statements and provided significant investment in the area.
5. There are a range of Commonwealth, State and local government policies and programs in place at the time of this report
6. A number of initiatives have been proposed for the area by the State and the Commonwealth government.
7. These initiatives have been informed in ad hoc ways by past enquires, such as the comprehensive skills report by Buchan Consulting in 2005 (Buchan Consulting (2005) and will continue to be informed by forthcoming reports, such as ‘Skilling the Valley’, Skills Victoria.

Recommendation 7

That steps be taken, possibly by the Latrobe Valley Transition Committee in the first instance, to integrate the diversely sourced reports and recommendations on the Latrobe Valley (and Gippsland) with a view to developing integrated and cohesive policies for transition of vulnerable workers.
3. The Latrobe Valley Power Generation Industry

This section provides a conceptual and empirical overview of the organisational structure of the Latrobe Valley's privatised power generation industry. Drawing upon ABS data, the section presents some of the major labour force characteristics of those directly employed in Latrobe Valley's Electricity, Gas, Water and Mining industry and discusses some of the difficulties of using statistical data to obtain information about Latrobe Valley's power industry workers. It provides an analysis of the roles and qualifications of workers employed directly by the power generation companies in their mines and electricity generators and concludes with a discussion of skills and labour market issues related to power generation contractors.

3.1 The Organisational Structure of the Power Generation Industry

The corporatisation and subsequent privatisation of the State Electricity Commission of Victoria (SECV) in the 1990s resulted in the breakup of the vertically integrated publicly-owned organisation into new privately owned organisational forms. Since privatisation, a disaggregated industry structure has dominated Victoria’s electricity generation sector in the Latrobe Valley, with multinational corporations playing a dominant role. Strict ownership rules limited the ownership to one and part of a second generator. While in most cases electricity generators also own and operate open-cut mines that provide fuel for their generation business, the business model pursued by the four major power generation companies constituted a ‘network’ of organisations, between a generating company and contractors (see Grugulis, I. and Vincent, S. 2005; Grugulis, et al., 2003).

Through outsourcing and disaggregation of its activities, the generators rely upon inter-organisational alliances with other independent contractors and sub-contractors for their ongoing operations. The power industry is organised as a ‘flexible organisational network’, as indicated in Figure 5.

![Figure 5 – The Power Industry as a Flexible Organisational Network](image-url)
The Latrobe Valley power industry is composed of four components, distinct from each other but inter-related and inter-connected. The lead or core firms are the generators and their associated mines. Second, there is a layer of contractors, supporting and working with the generators as continuous presence contractors (CPCs). These contractors undertake business activity that is closely aligned with the needs of the lead firms. A particularly strong version of a CPC is where they operate as alliance contractors, where the activity of the contractor is a *de facto* element of the core business and thus whose profits are tied to the economic fortunes of the generators. Third, a more removed although still closely linked to and dependent on the on-going operations of the lead firms is a diverse grouping of independent contractors. These contractors tend to rely upon procuring tender contracts with the lead firm (i.e. generators) although they also engage in similar contracts with other lead firms in other industries. In addition, they may or may not be on fixed-price arrangements. Fourth, a group of contractors who do not work directly to the lead firms. Rather, they are sub-contractors that provide services to CPCs and/or independent contractors. The conceptualisation of the industry in this way, as a particular organisational form defined by a layered set of relationships provides the basis for an understanding of the industry as both integrated and cohesive, but one that may require different strategies and responses in the event of transition to a low carbon economy and the closure of at least one power generator over time. This model allows a better a more comprehensive analysis of the nuances and specific skills within the power industry defined by the different components that define the ‘flexible organisational network’.

In this organisational model, the generators operate as lead firms who rely on the work of continuous presence contractors, independent contractors and sub-contractors for their ongoing operations. This multiplicity of relationships plus the capacity of generators to renegotiate contracts create what can be termed as a ‘flexible network’ of relationships, which taken together constitute the power industry in the Latrobe Valley, centred on the generation of power.

The components of Latrobe Valley power industry include brown-coal mining, power generation, construction and maintenance with mining and generation the primary economic activity of the lead firms (i.e. generator owners). While there are limited formal links between the generators, they may share a mine (Loy Yang A and B) and contractors and sub-contractors may serve more than one generator. At the same time there will be a set of dedicated relationships between some contractors and a particular generator. Occupations in the power industry thus cover a diverse range of mining, construction, maintenance, manufacturing and operator skills.

Since privatization, multinational corporations have acquired a major ownership stake in the region’s power generation industry. Hazelwood Power Station and Loy Yang B are owned by France’s GDF Suez while Yallourn Power Station is currently owned by China Light and Power. Loy Yang A, the largest generator, is owned by a consortium of companies in which Sydney-based AGL Energy and Tokyo-based TEPCO have the largest stake. The Morwell Power Plant or Energy Brix Australia, which is the smallest of the brown-coal fired plants in the Latrobe Valley (generating capacity of 180 MW), is the only one that is fully Australian-owned.

### 3.2 The Power Generators and Associated Mines

There are a number of mines and power stations in the region. These include:
Hazelwood (owned by GDF Suez (International Power)). This power station has 8 units, each of 200MW with a nominal capacity of 1,600 MW. The mine area is 761 hectares with an overburden depth of 18 metres and coal at an average depth of 100 metres. The mining technique employed is bucket wheel dredgers. Hazelwood employs 520 permanent staff and about 300 contractors with an increase of casual staff of up to 500 staff during outages.

Loy Yang B (owned by GDF Suez (International Power) and Mitsui co, ltd). This power station has 2 units, each of 500 MW (1,000MW) and it uses the coal from Loy Yang Mine.

Loy Yang Power (or Loy Lang A) is owned by a consortium known as the Great Energy Alliance Corporation with the largest shareholders being Sydney-based AGL Energy (32.5 per cent) and Tokyo-based Tokyo Electric Power Company (32.5 per cent). Loy Yang power station is the largest Victorian power station with 4 units each at 500+MW (2,200MW). The mine area covers 605 Hectares with an overburden depth of 5 – 24 metres and a combined coal seam thickness of 260 metres. The mining technique is bucket wheel dredgers. The power station employs 200 employees with the mine employing another 260 staff. In addition there are 60 staff in Corporate (HR, finance etc.) and 20 staff in marketing. Revenue generated is in the order of $550 M per annum.

Yallourn Power Station is owned by the Hong Kong-based China Light and Power. This is a vertically integrated company with retail as part of their business. The power station has 2 units each 360MW and 2 units each 380 MW (1480 MW). The mine area is 1,625 Hectares with an overburden depth of 18 metres and a coal thickness of 100 metres. The mining technique is bulldozers for coal and dredgers for overburden. The power station and mine employs 450 staff including alliance contractors.

Energy Brix is a smaller concern owned by HRL. This power station generates 170 MW with 130 MW going to the grid. It employs 73 staff with about 40 – 45 embedded contractors.

Jeeralang Power Station is a gas turbine power station near Morwell. It was constructed in two stages and has a capacity of 449 megawatts. The station is a peaking facility which is utilised only during periods of peak demand. It is also used as a black start facility to restore power to the grid in the event of major system failure. As a result the actual capacity factor of the station is less than 5 per cent. It is currently operated by Ecogen Energy.

Hazelwood, Yallourn and Energy Brix Power Stations have all expressed interest in the Commonwealth Government's Contract for Closure initiative that aims to close about 2000 megawatts of highly emitting coal-fired power generation capacity by 2020.

### 3.3 Employment in the power generation industry

As discussed above, the power generation industry workforce comprises both direct and indirect employees. While it is relatively easy to identify the organisational components of the ‘flexible organisational network’ of the power generation industry in the Latrobe Valley region, it is more difficult to map the entire workforce, contributing to both under- and over-numeration of the power generation workforce in the Latrobe Valley region. Published figures provided for Latrobe Valley's power generation industry often vary significantly from between 2,500-5,000 workers. This imprecision highlights conceptual differences as well as data collection difficulty.

A worker directly employed by a continuous presence contractor, for example, whose primary function is maintenance work would be coded by the Australian Bureau of Statistics (ABS) under the Australian and New Zealand Standard Industrial Classification 2006 (ANZSIC) as a civil engineering and construction worker. Many of these employees are dependent on the power generation industry for their ongoing employment and their exclusion from the category of power worker is problematic. However, it is unclear if all the workers within this classification in the
Latrobe Valley region are employed solely in the power generation sector. The situation becomes more complex with the inclusion of short-term contractors and sub-contractors. The power generation industry may provide only a proportion of the employment for these workers, and the ABS may count the workers in either the manufacturing or construction industry. The inclusion of all manufacturing and construction workers located in the region in the count of power generation workers would massively inflate the number of workers in the sector.

A further issue in drawing on ABS census data is that in examining a small population such as the power generation industry within a particular locality like the Latrobe Valley, detailed data is subject to confidentialising. This particularly affects the analysis of women workers in the industry, as there are very small numbers involved. To minimise the impact of confidentialising, larger groups of data have been selected where possible and proportional figures have been employed to minimise the incidence of inconsistent totals.

For the purposes of this study, we have selected the two ANZSIC 2006 categories Electricity, Gas, Water and Waste Services and Mining. These categories include all workers who are directly employed by the power generators and a high proportion of those employed by continuous presence contractors in the coal mines associated with the power generation sector. These categories may include a number of workers in other sub-sectors of the industries who are less likely to be impacted by the introduction of a carbon price; however, this represents a small proportion overall within the categories (less than 10 per cent). These categories (electricity, gas, water and waste services and mining) provide a relative consistency of experiences within the industry in terms of the age structure of the industries, the levels of education and training and income distribution. However, they exclude many of the workers indirectly employed in the sector through contractors and sub-contractors. The inclusion of all such workers is impractical as it would require the inclusion of workers outside the industry and this may conceal the key patterns of employment, education and training and income distribution.

The categories selected may be considered to be workers most impacted by carbon pricing. This selection provides the basis for a useful analysis of the key workforce, creating a representative sample, balancing the size of the analysis group to reflect the proportion of workers affected, whilst minimising the impact of ABS confidentialising. It should be noted that this statistical analysis provides a framework for understanding the key structural issues affecting the power generation industry workforce. When the statistical material is examined in relation to the evidence provided by power industry employers, workers and their union representatives, the findings support each other. Thus the analysis should be read in conjunction with the qualitative data collected from workers, union representative and employers.

While the 2006 census is somewhat dated, the workforce in electricity, gas and water and mining in the Latrobe Valley has been relatively stable between 2006 and 2011. Using this census data allows us to investigate in some detail the very small group of employees in these industries within the particular local government areas. Where appropriate, census data has been supplemented with data from Labour Force surveys and other data collections provided by the ABS.

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1 Confidentialising is the random adjustment of small-sized cells to avoid the release of confidential data about individuals.
The workforce

Across the Latrobe Valley region there was a total of 3449 employees within the Electricity, Gas, Water and Waste and the Mining (EGW&M) sectors (ABS 2006). Almost two thirds (62 per cent) of these workers live in Latrobe City local government area, while 26 per cent live in Wellington Shire and 11 per cent live in the shire of Baw Baw. Amongst the workers in this sector, there is an extreme gender imbalance with 3141 (91 per cent) employees men, while only 308 (9 per cent) are women (ABS 2006).

This EGW&M sector represents almost six per cent of all employment within the Latrobe Valley region. Amongst men, the sector provides an even more significant proportion of employment (9 per cent), representing the fourth highest sector of men’s employment after construction (15 per cent), manufacturing (14 per cent) and agriculture, forestry and fishing (10 per cent).

TABLE 1. Employment by industry and sex, Latrobe Valley region

<table>
<thead>
<tr>
<th>Industry</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry and Fishing</td>
<td>9.8%</td>
<td>6.0%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Mining</td>
<td>2.9%</td>
<td>0.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Electricity, Gas, Water and Waste Services</td>
<td>6.4%</td>
<td>0.8%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>14.4%</td>
<td>4.1%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Construction</td>
<td>15.1%</td>
<td>2.1%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>4.1%</td>
<td>1.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>8.9%</td>
<td>16.7%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Accommodation and Food Services</td>
<td>3.4%</td>
<td>7.6%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Transport, Postal and Warehousing</td>
<td>4.8%</td>
<td>1.6%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Information Media and Telecommunications</td>
<td>1.0%</td>
<td>1.3%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Financial and Insurance Services</td>
<td>1.2%</td>
<td>2.9%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Rental, Hiring and Real Estate Services</td>
<td>0.9%</td>
<td>1.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Professional, Scientific and Technical Services</td>
<td>3.1%</td>
<td>3.6%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Administrative and Support Services</td>
<td>2.9%</td>
<td>2.6%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Public Administration and Safety</td>
<td>6.0%</td>
<td>7.4%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Education and Training</td>
<td>4.3%</td>
<td>13.2%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Health Care and Social Assistance</td>
<td>3.4%</td>
<td>20.3%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Arts and Recreation Services</td>
<td>0.9%</td>
<td>1.0%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Other Services</td>
<td>3.9%</td>
<td>3.5%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Inadequately described</td>
<td>1.4%</td>
<td>0.7%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Not stated</td>
<td>1.4%</td>
<td>1.5%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing
Cells in this table have been randomly adjusted to avoid the release of confidential data.

The age structure of the EGW&M workforce varies quite significantly along gender lines as shown in Figure 6, with 74 per cent of men working in the Sector aged over forty years, while 60 per cent of women employed in the Sector were less than forty years of age (ABS 2006).
Drilling down into the detailed data for the industry sub-sectors within the EGW&M sector (table 2), we find that fossil fuel electricity generation accounts for the highest level of employment for both men and women within the Latrobe Valley region. Oil and gas extraction and electricity supply (not further defined) also provide a significant proportion of employment within the sector. Other mining support services, which may include workers employed on short term contracts to provide maintenance services for mining equipment, employ a significant proportion of men, higher, in fact than the number of workers employed directly in coal mining and mining (not further defined).

TABLE 2. Employment in industry sub-sector by gender Electricity, Gas, Water and Mining, Latrobe Valley

<table>
<thead>
<tr>
<th>Industry</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fossil Fuel Electricity Generation</td>
<td>946</td>
<td>30.1%</td>
</tr>
<tr>
<td>Oil and Gas Extraction</td>
<td>464</td>
<td>14.8%</td>
</tr>
<tr>
<td>Electricity Supply, nfd</td>
<td>415</td>
<td>13.2%</td>
</tr>
<tr>
<td>Other Mining Support Services</td>
<td>216</td>
<td>6.9%</td>
</tr>
<tr>
<td>Water Supply</td>
<td>191</td>
<td>6.1%</td>
</tr>
<tr>
<td>On Selling Electricity &amp; Electricity Market</td>
<td>183</td>
<td>5.8%</td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Distribution</td>
<td>120</td>
<td>3.8%</td>
</tr>
<tr>
<td>Coal Mining</td>
<td>111</td>
<td>3.5%</td>
</tr>
<tr>
<td>Solid Waste Collection Services</td>
<td>87</td>
<td>2.8%</td>
</tr>
<tr>
<td>Other Construction Material Mining</td>
<td>56</td>
<td>1.8%</td>
</tr>
<tr>
<td>Gas Supply</td>
<td>55</td>
<td>1.7%</td>
</tr>
<tr>
<td>Petroleum Exploration</td>
<td>47</td>
<td>1.5%</td>
</tr>
<tr>
<td>Electricity Generation, nfd</td>
<td>45</td>
<td>1.4%</td>
</tr>
<tr>
<td>Waste Collection Services, nfd</td>
<td>32</td>
<td>1.0%</td>
</tr>
<tr>
<td>Waste Remediation &amp; Materials Recovery Services</td>
<td>23</td>
<td>0.7%</td>
</tr>
<tr>
<td>Mining, nfd</td>
<td>22</td>
<td>0.7%</td>
</tr>
<tr>
<td>Waste Treatment and Disposal Services</td>
<td>21</td>
<td>0.7%</td>
</tr>
<tr>
<td>Industry</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Electricity, Gas, Water and Waste Services, nfd</td>
<td>20.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Electricity Transmission</td>
<td>16.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Gravel and Sand Quarrying</td>
<td>12.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Other Non-Metallic Mineral Mining and Quarrying</td>
<td>11.3%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Copper Ore Mining</td>
<td>7.2%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Mineral Exploration</td>
<td>7.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other Waste Collection Services</td>
<td>7.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Mineral Sand Mining</td>
<td>6.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Bauxite Mining</td>
<td>5.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hydro-Electricity Generation</td>
<td>4.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Waste Collection, Treatment and Disposal Services, nfd</td>
<td>4.1%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Water Supply, Sewerage and Drainage Services, nfd</td>
<td>4.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Nickel Ore Mining</td>
<td>3.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Non-Metallic Mineral Mining and Quarrying</td>
<td>3.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Total</td>
<td>3,143</td>
<td>306.0%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing
Cells in this table have been randomly adjusted to avoid the release of confidential data.

It should be noted that these figures, taken at a single census date, would significantly underestimatethe number of workers involved in outage and maintenance work over time, due to the employment of workers on short-term contracts for this work.

Table 3 shows that the occupational structure of the sector is unsurprisingly gendered, with the highest proportion of men employed as technicians and trade workers (43 per cent).

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians and Trades Workers</td>
<td>42.5%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Machinery Operators And Drivers</td>
<td>24.4%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Professionals</td>
<td>9.6%</td>
<td>20.6%</td>
</tr>
<tr>
<td>Labourers</td>
<td>8.3%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Managers</td>
<td>7.9%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Clerical and Administrative Workers</td>
<td>4.6%</td>
<td>50.7%</td>
</tr>
<tr>
<td>Community and Personal Service Workers</td>
<td>0.5%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Sales Workers</td>
<td>0.4%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Inadequately described</td>
<td>1.6%</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing
Cells in this table have been randomly adjusted to avoid the release of confidential data.

A significant proportion of men in the sector work as machine operators and drivers (24 per cent). These are semi-skilled occupations, primarily requiring on-the-job training. A further 8 per cent of workers were employed in the relatively unskilled role of labourer. The bulk of the workers, in these skilled, semi-skilled and unskilled roles, were supported by a smaller proportion of more highly skilled professionals (10 per cent) and managers (8 per cent).
In contrast, amongst women, the key occupations are clerical and administrative roles (51 per cent) and professionals (21 per cent), with smaller proportions of workers spread across labouring (7 per cent), technical and trades (7 per cent), management (6 per cent) and machinery operation (4 per cent) roles.

**Education and training**

The age and occupational structures of the EGW&M sector prefigure our findings on schooling and the formal training held by workers. In the early 1980s, when many of the men working in this sector entered the workforce, apparent year 12 school retention rates were as low as 30 per cent, while in more recent years the rate has increased to approximately 70 per cent (ABS 1997; 2002). Figure 7 shows that there has been increasing apparent school retention rates over this period. This suggests that amongst the EGW&M workforce we would expect to find lower levels of year 12 completion amongst the older men than amongst the women, many of whom have entered the workforce since the early 1990s.

![Figure 7 Apparent school retention rates Australia, 1969-2001](image)

**Data Sources:** ABS, 1972, 1997; 2002

Table 4 shows that indeed the older men were much less likely to have completed their schooling at year twelve than the younger women. However, higher levels of formal post school education, particularly at the certificate level, supplement the relatively lower levels of schooling for men in the sector.

<table>
<thead>
<tr>
<th>Schooling</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 or equivalent</td>
<td>31.4%</td>
<td>53.1%</td>
</tr>
<tr>
<td>Year 11 or equivalent</td>
<td>29.3%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Year 10 or equivalent</td>
<td>26.5%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Year 9 or equivalent</td>
<td>7.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Year 8 or below</td>
<td>3.6%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Did not go to school</td>
<td>0.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Not stated</td>
<td>1.9%</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

**Table 4. Level of schooling Electricity, Gas, Water and Mining Sector, Latrobe Valley region**

Data Source: 2006 Census of Population and Housing

Cells in this table have been randomly adjusted to avoid the release of confidential data.
Table 5 shows that almost half of all men (47 per cent) employed in the sector have a certificate level post-school qualification. Almost a third (29 per cent) of men employed in the sector had no post-school qualification. Almost half of all women (45 per cent) employed in the sector had no post-school qualification and a further 21 per cent had a certificate level qualification.

<table>
<thead>
<tr>
<th>Level of post school qualification</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate Degree Level</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Graduate Diploma and Graduate Certificate Level</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Bachelor Degree Level</td>
<td>8%</td>
<td>16%</td>
</tr>
<tr>
<td>Advanced Diploma and Diploma Level</td>
<td>9%</td>
<td>12%</td>
</tr>
<tr>
<td>Certificate Level</td>
<td>47%</td>
<td>21%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>29%</td>
<td>45%</td>
</tr>
<tr>
<td>Level of education not stated</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Level of education inadequately described</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing

Cells in this table have been randomly adjusted to avoid the release of confidential data.

Approximately half of all men (49 per cent) employed in the sector have post-school qualification in the engineering and related technologies field as shown in Table 6. Amongst these workers, as indicated in Table 7, 78 per cent held a certificate level qualification, a further 12 per cent held an advanced diploma or diploma, 9 per cent held a bachelor degree, while approximately one per cent has post-graduate qualifications.

<table>
<thead>
<tr>
<th>Field of qualification</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural and Physical Sciences</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Engineering and Related Technologies</td>
<td>49%</td>
<td>6%</td>
</tr>
<tr>
<td>Architecture and Building</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Agriculture, Environmental and Related Studies</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Health</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Education</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Management and Commerce</td>
<td>6%</td>
<td>32%</td>
</tr>
<tr>
<td>Society and Culture</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Creative Arts</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Food, Hospitality and Personal Services</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Mixed Field Programmes</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>29%</td>
<td>45%</td>
</tr>
<tr>
<td>Field of study not stated</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Field of study inadequately described</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing

Cells in this table have been randomly adjusted to avoid the release of confidential data.
For men, the second most common field of study post school was in Management and Commerce (6 per cent). Amongst these workers, the advanced diploma and diploma (37 per cent) was the most common level of qualification, closely followed by a bachelor degree (30 per cent), a certificate (18 per cent) and a postgraduate degree (9 per cent).

For women, 32 per cent held post school qualifications in the management and commerce field as shown in Table 6. Of these, almost half (44 per cent) held certificate level qualifications, 28 per cent held diplomas or advanced diplomas, a fourth held a bachelor degree (25 per cent), with 3 per cent having completed a graduate diploma or certificate and none having postgraduate qualifications. The second most common field of study for women was engineering and related technologies. Amongst these women, 42 per cent attained either a certificate level qualification or a bachelor degree, with the remainder having completed a diploma or advanced diploma (16 per cent).

<table>
<thead>
<tr>
<th>Field of qualification</th>
<th>Level of qualification</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering and Related</td>
<td>Postgraduate Degree Level</td>
<td>0.9%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Technologies</td>
<td>Graduate Diploma and Graduate Certificate Level</td>
<td>0.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>Bachelor Degree Level</td>
<td>8.9%</td>
<td>42.1%</td>
</tr>
<tr>
<td></td>
<td>Advanced Diploma and Diploma Level</td>
<td>12.0%</td>
<td>15.8%</td>
</tr>
<tr>
<td></td>
<td>Certificate Level</td>
<td>77.8%</td>
<td>42.1%</td>
</tr>
<tr>
<td>Management and Commerce</td>
<td>Postgraduate Degree Level</td>
<td>8.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>Graduate Diploma and Graduate Certificate Level</td>
<td>6.3%</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>Bachelor Degree Level</td>
<td>30.3%</td>
<td>25.3%</td>
</tr>
<tr>
<td></td>
<td>Advanced Diploma and Diploma Level</td>
<td>36.6%</td>
<td>27.5%</td>
</tr>
<tr>
<td></td>
<td>Certificate Level</td>
<td>18.3%</td>
<td>44.0%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing

Cells in this table have been randomly adjusted to avoid the release of confidential data.

**Household structure and income**

The census data from 2006 allows us to examine, in fine detail, the household make-up of EGW&M workers and to analyse the proportion of household income that is made up of individual income. The implication of this data is that we can examine how dependent a particular household may be on a single income originating from the EGW&M sector.

Table 8 shows that almost two thirds of workers in the EGW&M sector were either a husband or a wife in a registered marriage. A further 8 per cent were in de facto heterosexual relationships with 3 per cent in single parent households, and 10 per cent living alone. Just over one per cent of these workers live in group households, with less than one per cent in same sex de facto relationships.
Table 8. Household relationships, Electricity, Gas, Water and Mining Sector Latrobe Valley region

<table>
<thead>
<tr>
<th>Relationship to household</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Husband, Wife in a registered marriage</td>
<td>2,143</td>
<td>62.1%</td>
</tr>
<tr>
<td>Partner in de facto marriage, opposite-sex couple</td>
<td>285</td>
<td>8.3%</td>
</tr>
<tr>
<td>Lone parent</td>
<td>92</td>
<td>2.7%</td>
</tr>
<tr>
<td>Lone person</td>
<td>360</td>
<td>10.4%</td>
</tr>
<tr>
<td>Other relations</td>
<td>159</td>
<td>4.6%</td>
</tr>
<tr>
<td>Group household member</td>
<td>50</td>
<td>1.4%</td>
</tr>
<tr>
<td>Partner in de facto marriage, same-sex couple</td>
<td>3</td>
<td>0.1%</td>
</tr>
<tr>
<td>Others</td>
<td>357</td>
<td>10.4%</td>
</tr>
<tr>
<td>Total</td>
<td>3,449</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing

Cells in this table have been randomly adjusted to avoid the release of confidential data.

Similarly, the composition of workers’ families shows that the majority of these workers (53 per cent) were in couple families with children (Table 9). A further quarter of the workers (26 per cent) were in couple families without children. Four per cent of workers were in single parent families, 16 per cent were not living in family groups and one per cent were living with ‘other’ family members groups.

Table 9. Family Composition, Electricity, Gas, Water and Mining Sector, Latrobe Valley region

<table>
<thead>
<tr>
<th>Family Composition</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple family with no children</td>
<td>823</td>
<td>26%</td>
</tr>
<tr>
<td>Couple family with children</td>
<td>1,706</td>
<td>53%</td>
</tr>
<tr>
<td>One parent family</td>
<td>135</td>
<td>4%</td>
</tr>
<tr>
<td>Other family</td>
<td>18</td>
<td>1%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>518</td>
<td>16%</td>
</tr>
<tr>
<td>Total</td>
<td>3,200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Data Source: 2006 Census of Population and Housing

Cells in this table have been randomly adjusted to avoid the release of confidential data.

These figures suggest that the workers from the EGW&M sector living in the Latrobe Valley region have relatively traditional family structures. The question is: Does this translate to traditional patterns of family income, with a dependence on the male-breadwinner model dominating employment and family relations?

Figure 8 shows the distribution of income amongst EGW&M sector workers. Women’s income is relatively normally distributed, with 65 per cent of women earning $1000 or less per week. In contrast, men’s income tends to be skewed towards the higher end of the income distribution with approximately 78 per cent of all men earning incomes above $1000 per week.

---

Note: differences in the number of single parent families between table one and table two are due to the confidentialising processes used by the ABS.
The gendered distribution of income has implications for household income, as shown in Table 10. This table provides details of the number and proportion of individual workers whose income makes up a significant proportion of their household income. It shows that across all types of family composition, 43 per cent of the men who worked in the EGW&M sector provided 60 per cent or more of the household income, with 15 per cent providing 100 per cent of the household income.
Table 10: Family composition by dependence on individual income, Electricity, Gas, Water and Mining Sector Latrobe Valley region

<table>
<thead>
<tr>
<th></th>
<th>Couple family with no children</th>
<th>Couple family with children</th>
<th>One parent family</th>
<th>Other family</th>
<th>NA (singles)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual wage is 100% of household wage</td>
<td>125</td>
<td>17.1%</td>
<td>302</td>
<td>19.1%</td>
<td>34</td>
<td>31.2%</td>
</tr>
<tr>
<td>Individual wage is 60% or more of household wage</td>
<td>270</td>
<td>37.0%</td>
<td>480</td>
<td>30.4%</td>
<td>33</td>
<td>30.3%</td>
</tr>
<tr>
<td>Individual wage is 59% or less of household wage</td>
<td>335</td>
<td>45.9%</td>
<td>797</td>
<td>50.5%</td>
<td>42</td>
<td>38.5%</td>
</tr>
</tbody>
</table>
| Not Applicable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 457 | 99.3% | 457 |)
| Total          | 730 |                         | 1579 |                       | 109 |                       | 15 |                       | 460 |                       | 2893 |       |
| **Women**      |                               |                            |                  |             |              |       |
| Individual wage is 100% of household wage | 6 | 6.6% | 3 | 2.4% | 11 | 44.0% | 0 | 0.0% | 3 | 5.4% | 23 | 7.6% |
| Individual wage is 60% or more of household wage | 6 | 6.6% | 6 | 4.9% | 4 | 16.0% | 0 | 0.0% | 0 | 0.0% | 22 | 7.3% |
| Individual wage is 59% or less of household wage | 79 | 86.8% | 114 | 92.7% | 10 | 40.0% | 6 | 100.0% | 0 | 0.0% | 218 | 72.4% |
| Not Applicable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 94.6% | 53 |)
| Total          | 91 |                         | 123 |                       | 25 |                       | 6 |                       | 56 |                       | 301 |       |
When we examine households that comprise a couple family with children, we find that 49.5 per cent of the men who worked in the EGW&M sector provided 60 per cent or more of the household income, with 19 per cent providing 100 per cent of the household income. These proportions are similar to those operating in couple families with no children, but are quite different amongst sole-parent families where up to 60 per cent of men provide more than 60 per cent of the household income.

In contrast, women working in the EGW&M sector in the Latrobe Valley region were much more likely to contribute less than 59 per cent of household income, with 92.7 per cent of women in couple households with children and 86.8 per cent of women in couple households without children contributing 59 per cent or less to their household incomes. Amongst women in lone-parent households, 60 per cent of women contributed 60 per cent or more of the household income as is to be expected, but the overall numbers are relatively small at 25 women (subject to confidentialising).

3.4 Summary and Key Findings

The power industry workforce employs around 3500 - 4000 workers (around 6 per cent of the regional workforce), and nearly two thirds live in Latrobe City area. While the figures are not available it is likely that this number is an underestimate because of the ad hoc employment of workers in outage, maintenance and related work. Although it is not the largest grouping within the Latrobe Valley region it nevertheless constitutes a significant cluster of workers who face an uncertain future.

The workforce comprises mainly older men with many having none or few formal qualifications. Of those with qualifications men are likely to have trade and technical qualifications, while women tend to have qualifications in management and commerce. Overall, however, significant numbers had no qualifications, with more women without qualifications than men. Of note, most households are disproportionately reliant on male incomes.

These patterns of employment play out in very specific ways. They set the scene for the analysis of skills and job roles within the industry.

**Key findings:**

1. The power generation industry is characterised by a flexible organisational network, comprising the power generators/mines and contractors to these companies, either directly or indirectly.
2. The workforce data for the industry is limited and dated (although there has been little change since then).
3. The workforce comprises approximately 4000, mainly men and on average over the age of 40 years.
4. Most workers live in Latrobe City, although substantial numbers live in the other two local government areas.
5. Many have no qualifications, with women less likely to have a qualification than men.
6. Households rely disproportionately on men’s wages.

**Recommendation 8**

That policy on skills acquisition, skills recognition and up-skilling be premised on the understanding of socio-demographics of the workforce in the power generation industry, and that a critical and essential focus is one that recognises and understands the household composition and the remuneration patterns that sustain households.
4. Work Roles and Skills in the Power Generator Industry

The employment profile just presented, covering socio-demographic detail, including the household relationship to job remuneration, sets the scene for an analysis of work roles and skill profiles. These roles and profiles constitute a benchmark for the whole sector. Nonetheless, it is important to note that the roles and skills identified below may not fully reflect the skills, tasks, responsibilities and qualifications of workers who perform these tasks. In interviews with workers, many indicated they were expected to perform a variety of tasks that extend beyond their specified roles. It was also often the case that these expectations had enabled them to acquire different sorts of skills over their working career.

One of the difficulties for workers, however, was that management often overlooked these skills and expanded role expectations. Because most of the skills acquired occurred through on-the-job training, self-directed learning, worker experiences and problem solving, workers felt it would be difficult to have these skills recognized outside their current employment situation. These empirical issues highlight the theoretical and methodological challenges of defining skills and roles as discussed in the introductory chapter.

This section provides an overview of the type of roles and skills found among those directly employed by the power generating companies. The following tables were created through a three step process involving:

1. An initial mapping of skills, knowledge and job roles to qualifications and other training products from VET, higher education and other educational sources;
2. Consultation with businesses and representatives from organisations relevant to the generation and mining sectors of the Latrobe Valley;
3. Revision of the skills inventory to reflect the outcomes of industry consultation.

4.1 Job Roles

The job roles are presented first in an overview form, listing mining and generation, and cross-referencing education. Table 11 presents a summary of the roles associated with the power generation sector in the Latrobe Valley.
Table 11. Summary of job roles in the Victorian coal mining & generation sector

<table>
<thead>
<tr>
<th>Mining Roles</th>
<th>Semi Skilled</th>
<th>Skilled</th>
<th>Trade</th>
<th>Technical / Supervisor</th>
<th>Professional / Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labourer</td>
<td>Driller – Exploration</td>
<td>Boilermaker / Welder Fitter</td>
<td>CAD Drafter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal and Ashmen Assistants</td>
<td>Laboratory Assistant</td>
<td>Electrician</td>
<td>GIS Specialist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Field</td>
<td>Mobile Plant Operator / Driver</td>
<td>Mechanic -</td>
<td>Electrical Technician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Trades</td>
<td>• Crane</td>
<td>• Automotive</td>
<td>(Instrument &amp; controls)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Surveying</td>
<td>• Dozer</td>
<td>• Plant</td>
<td>Environmental Officer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Driller</td>
<td>• Crusher</td>
<td>• Diesel</td>
<td>Geoscience Technician</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dragline</td>
<td>• Heavy Vehicle</td>
<td>Maintenance Technician</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Excavator / Shovel</td>
<td></td>
<td>Mine Planner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generation Roles</td>
<td>Plant Serviceman</td>
<td></td>
<td>Mine Surveyor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashman</td>
<td>Beltworker</td>
<td></td>
<td>Safety &amp; Health Officer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouse operators/Storemen</td>
<td>Fire services</td>
<td></td>
<td>Supervisor -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility/cleaner</td>
<td>Scaffold / Rigger</td>
<td>• Maintenance Foreman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Production Foreman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plant Foreman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Shift Boss</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Education & Training | Jr Apprenticeship including VET / TAFE qualification OR Adult Apprenticeship including VET qualification (may have been semi-skilled or skilled operator). | VET / TAFE or University qualification plus on-the-job training. | University degree OR extensive experience and successful performance (for management roles only). |

Skills Transition for the Latrobe Valley - Benchmark occupations and skill sets
This framework is adapted from the ‘professional pathways’ model described by the Australian Minerals Council. The table classifies workers in both the mining and generation sectors in relation to education and training appropriate to the skill requirements for these roles.

The specific skills and knowledge, qualifications and expected salary range associated with each of these roles is presented in Tables 12 and 13. It should be noted that these tables describe roles, rather than providing an exhaustive list of job titles. It is also important to note that whilst the qualifications and training programs identified in these tables are appropriate to skill requirements of the roles, often workers possess much higher qualifications.

<table>
<thead>
<tr>
<th>Role</th>
<th>Skills &amp; Knowledge</th>
<th>Relevant Education &amp; Training</th>
<th>Estimated Salary Range*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashman</td>
<td>Collects ash from precipitation which is then pumped into sluiceways. Is able to operate heavy machinery and has a boiler ticket. May have a forklift licence</td>
<td>Boiler ticket&lt;br&gt;Forklift Licence</td>
<td>Level 10 with shift loading: $97,000 – $115,000</td>
</tr>
<tr>
<td>Warehouse operators/Storemen</td>
<td>Unloading and loading of stock and supplies. Use of basic loading equipment and information systems.</td>
<td>Forklift license</td>
<td>Level 10: $97,000 - $115,000</td>
</tr>
<tr>
<td>Utility/cleaner</td>
<td>Routine and period maintenance, basic carpentry, cleaning, problem solving skills</td>
<td></td>
<td>Level 10 with shift loading: $97,000 - $110,000</td>
</tr>
<tr>
<td>Assistant Unit Controller</td>
<td>Provide assistance and support to unit controllers (see below)</td>
<td>Unit attendant training course (in house)</td>
<td>Level 14 with shift loading: $105,000 - $120,000</td>
</tr>
<tr>
<td>Unit Operator (or unit controller / boiler operator/unit technician / plant controller/plant operator)</td>
<td>Operate, maintain and direct the operation of generating facilities. Well developed skills in operation of electrical, hydraulic, pneumatic and mechanical equipment. Systems construction, capacities, limitations, theories of operation and operating procedures; plant design and equipment locations; identify probable causes of equipment and systems malfunctions; reporting procedures and practices, maintenance procedures and practices; electrical and mechanical drawings and generation plant terminology and nomenclature</td>
<td>Boiler Ticket&lt;br&gt;Certificate III in ESI Generation (Operations)&lt;br&gt;Certificate IV, Diploma and Advanced Diploma in Process Plant Technology&lt;br&gt;Electrician - Electrical Maintenance (Engineering)&lt;br&gt;Certificate IV in Engineering - MEM40105</td>
<td>Level 16 with shift loading: $114,000 – $130,000</td>
</tr>
<tr>
<td>Environmental Officer</td>
<td>Perform laboratory tests associated with all compliance measures for the operation and maintenance of boiler, cooling tower and service</td>
<td>Bachelor of Applied Science</td>
<td>Officer: $80,000 - $100,000</td>
</tr>
</tbody>
</table>
### Table 12: Generation Roles and Skills

<table>
<thead>
<tr>
<th>Role</th>
<th>Skills &amp; Knowledge</th>
<th>Relevant Education &amp; Training</th>
<th>Estimated Salary Range*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrician</strong></td>
<td>Perform an electrical maintenance function within a complex Power Station environment. Interpretation of documentation and an intuitive assessment in order to diagnose faults and implement maintenance.</td>
<td>Electrician - Electrical Maintenance (Engineering) Certificate IV in Engineering - MEM40105</td>
<td>$82,000 - $100,000</td>
</tr>
<tr>
<td><strong>Instrument &amp; controls technician</strong></td>
<td>Troubleshoots, repairs, calibrates and performs preventative maintenance on instrument and control systems and continuous process hardware. Installs, repairs and maintains a variety of plant equipment including, but not limited to, electrical bus and bus duct, dry and oil immersed power transformers, switchgear, power plant equipment, lighting systems and AC and DC motors</td>
<td>Certificate III in Instrumentation and Control Certificate IV in Electrical - Instrumentation</td>
<td>$80,000 - $100,000</td>
</tr>
<tr>
<td><strong>Maintenance Technician (Mechanical, Electrical, Controls)</strong></td>
<td>Routine, periodic and emergency maintenance on mechanical, electrical and control systems. Operate and adjust instrument and controls, electrical, hydraulic, pneumatic and mechanical equipment and plant. Determine probable causes of equipment and system malfunction. Interpret charts, graphs and gauge scales, troubleshoot equipment and system problems and interface with others</td>
<td>Cert IV Electrical Certificate III in Electronics and Communications Certificate III in Engineering - Mechanical Trade Certificate III in Engineering - Production Systems Certificate III in ESI Generation (Operations)</td>
<td>Contracted staff: $82,000 - $100,000</td>
</tr>
<tr>
<td><strong>Shift Supervisor/Team Leaders</strong></td>
<td>Provide leadership and frontline management of unit controllers. Engage with network operators to “bid” and adjust unit output in real time.</td>
<td>AEMO run specialist courses</td>
<td>Level 18 with shift loading: $145,000 - $160,000</td>
</tr>
<tr>
<td><strong>Planning &amp; Scheduling</strong></td>
<td>Prepare and monitor plans and schedules for maintenance, testing, overhauls and modification of plant and outages.</td>
<td>VCE or equivalent and on-the-job experience.</td>
<td>Level 16 with shift loading: $114,000 – $130,000</td>
</tr>
<tr>
<td>Role</td>
<td>Skills &amp; Knowledge</td>
<td>Relevant Education &amp; Training</td>
<td>Estimated Salary Range*</td>
</tr>
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</tr>
<tr>
<td>Maintenance coordinator</td>
<td>Leadership of a small team of technical specialists engaged with the asset management processes of the power station  Development, prioritise and manage maintenance plans and asset strategies</td>
<td>Qualifications in Commercial Business Management; or Qualifications in an appropriate discipline or qualifications to enable Membership of the Institution of Engineers Australia (Engineering Officer); or Extensive Experience (15-20 years +)in the Power Generation Industry</td>
<td>Level 17 with shift loading: $134,000 - $150,000</td>
</tr>
<tr>
<td>Engineer (Plant, Systems, Technologist, Mechanical, Electrical, Chemical/environmental)</td>
<td>Responsible for betterment, engineering; installation and maintenance or repair of power generation equipment; statutory compliance, efficiency and performance of the coal fired generating facility  Assisting in the whole of life asset management of an ageing plant. Engineering challenges posed by carbon pricing. Innovative solutions to resource constraints (e.g. water). Engineering challenges due to deteriorating fuel quality. Coordinating peers and work group to achieve outputs without direct line authority</td>
<td>Bachelor of Engineering (Chemical) Bachelor of Engineering (Electrical) Master of Engineering (Electrical) Bachelor of Engineering (Mechanical) Master of Engineering (Mechanical) Master of Energy Systems</td>
<td>$140,000 - $155,000</td>
</tr>
<tr>
<td>Corporate Services (Finance, Procurement, Contracts HR)</td>
<td>Management of ordering and warehousing of stock and supplies  Contract management of external suppliers and contractors</td>
<td>Bachelor of Commerce (Finance) Bachelor of Commerce (Accounting and Finance) Diploma of Human Resources Management</td>
<td>Pay role officer: $82,000 - $90,000 CFO: $120,000 - $150,000</td>
</tr>
<tr>
<td>Operations/Production manager</td>
<td>Strategic development to optimise plant performance and drive efficiency in output production. Analysis of network constraints and formulation of appropriate response strategies Management and leadership of large teams of specialists</td>
<td>Qualifications in Commercial Business Management; or Qualifications in an appropriate discipline or qualifications to enable Membership of the Institution of Engineers Australia (Engineering Officer); or Extensive Experience (15-20 years +)in the Power Generation Industry</td>
<td>Level 18 with shift loading: $150,000 - $200,000</td>
</tr>
<tr>
<td>Role</td>
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<td>Relevant Education &amp; Training</td>
<td>Estimated Salary Range*</td>
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<tr>
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</tr>
<tr>
<td>Community Engagement &amp; Communications</td>
<td>Internal and external communications and public affairs. Coordination of community sponsorships.</td>
<td>Graduate Certificate in Social Science (Community Engagement) Bachelor of Arts (Media and Communications)</td>
<td>$110,000 - $120,000</td>
</tr>
</tbody>
</table>
### Table 13: Coal Mine Roles and Skills

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<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Labourer</td>
<td>Operating machines&lt;br&gt;Assisting workers to extract geological materials, using hand tools and equipment&lt;br&gt;Helping to extract craft workers, such as earth drillers, derrick operators, and mining machine operators and monitoring equipment operation during the extraction process</td>
<td>Predominantly on-the-job training</td>
<td>All-Rounders: $65,000 - $120,000&lt;br&gt;Source: Hays Salary Guide, 2011</td>
</tr>
<tr>
<td>Fuel Truck Operator/Serviceman</td>
<td>Refuel mobile plant in situ&lt;br&gt;Service &amp; lubricate mobile plant in the field &amp; in workshops&lt;br&gt;Monitor and maintain lubricant levels on Large Mining Equipment.</td>
<td>Predominantly on-the-job training</td>
<td>Service Person: $70,000 - $90,000&lt;br&gt;Source: Hays Salary Guide, 2011</td>
</tr>
<tr>
<td>Field Assistants (Trades, Surveyor, Driller)</td>
<td>Support functions (see skill descriptions alongside each role)</td>
<td>Dependent on role&lt;br&gt;Predominantly on-the-job training</td>
<td>Field Assistant: $60,000 - $80,000&lt;br&gt;Source: Hays Salary Guide, 2011</td>
</tr>
<tr>
<td>Mobile plant/Equipment Operator (Dragline, Dozer, Crusher, Driller, Longwall) Bucketwheel Dredge &amp; Travelling Stacker</td>
<td>Safe and efficient operation of large mine site equipment and machinery to dig, move, level, grade and load earth, rock or other materials&lt;br&gt;Prepare and maintain machines for operation&lt;br&gt;Work from drawings and markers under the direction of supervisors and engineers&lt;br&gt;Large Mining Equipment (LME) such as Bucketwheel Dredge is tethered to the conveyor system and is electrically powered via a High Voltage supply cable. They require highly trained workers to operate them safely.</td>
<td>Machinery Ticket Training: OHSCER205A Operate an Excavator (LE)&lt;br&gt;OHSCER217A Operate a Grader (LG)&lt;br&gt;OHSCER203A (LL). This is a nationally recognised qualification and covers you to operate a front end loader with an engine capacity of more than 2 litres</td>
<td>Mill Operator: $70,000 - $100,000&lt;br&gt;Jumbo Operator: $85,000 - $180,000&lt;br&gt;Longwall Coordinator: $120,000 - $150,000&lt;br&gt;Source: (miningcareers.com)&lt;br&gt;Mobile Plant Operator: $80,000 - $150,000&lt;br&gt;Source: Hays Salary Guide, 2011</td>
</tr>
<tr>
<td>Driller - Exploration</td>
<td>Drillers move, set up and operate drilling rigs</td>
<td>Certificate II in Extractive Industries</td>
<td>Surface Driller:</td>
</tr>
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<tbody>
<tr>
<td><strong>Beltworker</strong></td>
<td>Construct, install, maintain &amp; repair the kilometres of reinforced rubber conveyor belts that are employed for bulk materials handling in the Latrobe Valley</td>
<td>Predominantly on-the-job training</td>
<td>Not sourced</td>
</tr>
<tr>
<td><strong>Fire Services</strong></td>
<td>Repairs to fire suppression systems including foam fire suppression systems, Machinery maintenance and troubleshooting, Installation &amp; service of fire-fighting pipework, Installation &amp; service of control valves &amp; sprinklers, Issuing of Hot Works Permits, Issuing Confined Space Entry Permits</td>
<td>On-the-job training Granting of Site Authorisation for the issuing of Permits after successful completion of 'Approved' training course and Competency Assessment.</td>
<td>Not sourced</td>
</tr>
<tr>
<td><strong>Scaffolder/Rigger</strong></td>
<td>Installing and dismantling scaffold and rigging in mine site operations</td>
<td>High-Risk Licence issued by WorkSafe after Competency Assessment.</td>
<td>Not sourced</td>
</tr>
<tr>
<td><strong>Boilermaker/Welder</strong></td>
<td>Boilermakers mark out, cut, shape, assemble and fix metal to produce or repair storage tanks and other high pressure storage vessels, Interpret scale drawings and cut marked sections using hand tools or cutting torches; Study blueprints or specifications and decide which welding methods to use, cut metal shapes using flame cutting torches</td>
<td>Trade Apprenticeship Certificate IV, Diploma and Advanced Diploma in Process Plant Technology, Boiler ticket, Boilermaker Certificate III in Engineering - Fabrication Trade - MEM30305</td>
<td>Boilermaker/Welder: $75,000 — $95,000+ Source: Hays Salary Guide, 2011</td>
</tr>
<tr>
<td><strong>Fitters and Turners (Diesel/ Instrument/Mechanical)</strong></td>
<td>Fitters are responsible for the maintenance, repair and manufacture of metal products and machinery, Mark the shape and dimensions of a part to be</td>
<td>Trade Apprenticeship Certificate IV, Diploma and Advanced Diploma in Process Plant Technology, MEM30205 - Certificate III in Engineering -</td>
<td>HD Fitter: $80,000 — $130,000+ Mechanical Fitter: $70,000 — $100,000</td>
</tr>
</tbody>
</table>
### Table 13: Coal Mine Roles and Skills

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</tr>
</thead>
<tbody>
<tr>
<td>Machinist</td>
<td>machined by studying blueprints and using measuring instruments;</td>
<td>Mechanical Trade</td>
<td>Source: <a href="http://www.hays.com.au">www.hays.com.au</a> (July 2011)</td>
</tr>
<tr>
<td></td>
<td>Assemble and fit machined parts using drill holes and tap threads, if necessary, for bolting parts together;</td>
<td>40591SA - Course in Intermediate Boiler Operator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check tightness of joints and operation of moving parts, and file or chisel part to make final adjustments if the fit is not perfect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanic (Automotive/Plant/Diesel/Heavy Vehicle)</td>
<td>Maintain and repair all onsite fixed and mobile machinery; Regular servicing of vehicles; Performance testing of machinery and vehicles to manufacturers specifications; Determine the need to replace components or equipment rather than repair, and Work on transmissions and hydraulic systems of heavy equipment.</td>
<td>Trade Apprenticeship Certificate III in ESI Generation (Operations) Certificate IV, Diploma and Advanced Diploma in Process Plant Technology</td>
<td></td>
</tr>
<tr>
<td>CAD Draftsperson/GIS Specialist</td>
<td>Spatial analysis using CAD based tools, Data collection, validation and formatting, performing spatial analysis and modelling, cartographic presentation &amp; 3D visualisation.</td>
<td>Bachelor of Engineering (Geosciences)</td>
<td>$115,000 - $130,000 Source: (Nov 2011 <a href="http://www.seek.com.au">www.seek.com.au</a>)</td>
</tr>
<tr>
<td>Electrical Technician (Instruments &amp; Controls)</td>
<td>Plan and carry out high quality maintenance, modification and project work on power station</td>
<td>Trade Apprenticeship (Electrician) + Certificate II, III in Process Plant</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>plant and control systems</td>
<td>Operations, Certificate III, IV in Resource Processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fault finding, modification and breakdown maintenance activities, solving technical</td>
<td></td>
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<tr>
<td></td>
<td>problems associated with plant/mine operation and maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Commission, test and adjust plant and plant systems</td>
<td></td>
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<tr>
<td></td>
<td>Work with high voltage electronic and instrumentation systems, diagnose and repair</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>digital equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Officer</td>
<td>Project management and development of environmental and infrastructure projects</td>
<td>Bachelor of Applied Science (Environmental/ Chemistry)</td>
<td>Junior: $60,000 - $80,000</td>
</tr>
<tr>
<td></td>
<td>Manage onsite water requirements</td>
<td></td>
<td>Senior: $75,000 - $100,000+</td>
</tr>
<tr>
<td></td>
<td>Ensure a strategic approach for the investigation of solutions to acid seepage</td>
<td></td>
<td>Source: <a href="http://www.jobsearch.gov.au">www.jobsearch.gov.au</a> (July 2011)</td>
</tr>
<tr>
<td></td>
<td>Facilitate and co-ordinate the production of site runoff and drainage plans and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>provide technical expertise to improve land management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geoscience Technician</td>
<td>Explore specific areas of the earth to determine its structure and the types of</td>
<td>Mine Geologist: $80,000 - $135,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rocks or minerals that exist</td>
<td>Graduate Geologist: $60,000 - $85,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contribute to environmental assessments and design measures to correct land</td>
<td>Source: <a href="http://www.hays.com.au">www.hays.com.au</a> (July 2011)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contamination and salination</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use tools such as GIS for analysis and preparation of data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mine Planner</td>
<td>Produce overburden stripping plans, dredging plans and schedules utilizing</td>
<td>Certificate II &amp; III in Extractive Industries (Operator)</td>
<td>Mine Planning Engineer:</td>
</tr>
<tr>
<td></td>
<td>professional mining engineering standards, computer modelling and best practices.</td>
<td>Certificate II-IV, Diploma/Advanced Diploma of Underground Coal</td>
<td>$147,000 - $160,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mining</td>
<td>Source; Jan 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><a href="http://www.mycareer.com.au">www.mycareer.com.au</a></td>
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<th>Relevant Education &amp; Training</th>
<th>Estimated Salary Range*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assist survey as required to ensure adequate controls are exercised</strong>&lt;br&gt;Conduct mining studies and make recommendations to management to optimise the exploitation of the company’s mine reserves</td>
<td>Management&lt;br&gt;Diploma of Surface Operations&lt;br&gt;Management</td>
<td>Planner:&lt;br&gt;$90,000 – $130,000&lt;br&gt;Source: Hays Salary Guide, 2011</td>
<td></td>
</tr>
<tr>
<td><strong>Mine Surveyor</strong></td>
<td>Conduct surveying and providing mine plans and drawings</td>
<td>Degree in Surveying</td>
<td>Mine Surveyor:&lt;br&gt;$75,000 - $100,000&lt;br&gt;Source: Hays Salary Guide, 2011</td>
</tr>
<tr>
<td><strong>Supervisor (Maintenance Foreman, Production Foreman, Plant Foreman, Shift Boss)</strong></td>
<td>Manage and oversee successful reports and internal/external liaisons&lt;br&gt;Manage specialised group of trades people, both internal and external&lt;br&gt;Oversee or assist in all relevant maintenance scheduling and reports and implement and oversee necessary OHS policies&lt;br&gt;Leadership and communications skills</td>
<td>Certificate III, IV in Resource Processing&lt;br&gt;Advanced Diploma of Extractive Industries Management&lt;br&gt;Diploma of Surface Operations Management</td>
<td>Mine Maintenance Foreman:&lt;br&gt;$105,000 - $150,000&lt;br&gt;Source: Jan 2012 <a href="http://www.my">www.my</a> career.com.au</td>
</tr>
<tr>
<td><strong>Engineers (Chemical, Civil, Electrical /Electronics, Mechanical, Mining, Geological)</strong></td>
<td><strong>Chemical &amp; Process</strong>: Research and develop processes and controls used in extraction processes. Advise operators on changes necessary to improve the process</td>
<td>Certificate III in Electrotechnology&lt;br&gt;Advanced Diploma of Electrical – Engineering&lt;br&gt;Bachelor of Engineering (Chemical)</td>
<td>Mechanical Engineer 3+ years experience:&lt;br&gt;$75,000 — $130,000&lt;br&gt;Site Engineer:</td>
</tr>
<tr>
<td>Role</td>
<td>Skills &amp; Knowledge</td>
<td>Relevant Education &amp; Training</td>
<td>Estimated Salary Range*</td>
</tr>
<tr>
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<td>------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>-------------------------</td>
</tr>
</tbody>
</table>
| Civil & Structural: planning  | planning, designing, and overseeing construction and maintenance of building structures and facilities, analyse survey reports, maps, drawings, blueprints, aerial photography, and other topographical or geologic data to plan projects | Bachelor of Engineering (Electrical)  
Master of Engineering (Electrical)  
Bachelor of Engineering (Civil)  
Master of Engineering (Civil)  
Bachelor of Engineering (Mechanical)  
Master of Engineering (Mechanical)  
Master of Energy Systems  
Bachelor of Engineering (Chemical)  
Bachelor of Electrical Engineering  
(Swinburne)  
Bachelor of Science (Geology)  
Master of Earth Sciences | $75,000 — $130,000  
Project Engineer:  
$85,000 — $140,000  
Principal Electrical Engineer  
$175,000 - $185,000  
Mining Engineer:  
$125,000 - $199,999  
Source: Jan 2012  
www.mycareer.com.au |
| Electrical & Electronics:     | design, develop and supervise the manufacture, installation, operation and maintenance of electrical systems, Plan and supervise power generating equipment; Supervise construction plans and specifications | Bachelor of Engineering (Electrical)  
Master of Engineering (Electrical)  
Bachelor of Engineering (Civil)  
Master of Engineering (Civil)  
Bachelor of Engineering (Mechanical)  
Master of Engineering (Mechanical)  
Master of Energy Systems  
Bachelor of Engineering (Chemical)  
Bachelor of Electrical Engineering  
(Swinburne)  
Bachelor of Science (Geology)  
Master of Earth Sciences | $75,000 — $130,000  
Project Engineer:  
$85,000 — $140,000  
Principal Electrical Engineer  
$175,000 - $185,000  
Mining Engineer:  
$125,000 - $199,999  
Source: Jan 2012  
www.mycareer.com.au |
| Mechanical:                  | Designing new machines, equipment or systems taking into account costs, and material suitability; Conducting research into the use and application of different fuels and energy, materials, heating, handling, storage and pumping of liquids, and Setting up work control systems. | Bachelor of Engineering (Electrical)  
Master of Engineering (Electrical)  
Bachelor of Engineering (Civil)  
Master of Engineering (Civil)  
Bachelor of Engineering (Mechanical)  
Master of Engineering (Mechanical)  
Master of Energy Systems  
Bachelor of Engineering (Chemical)  
Bachelor of Electrical Engineering  
(Swinburne)  
Bachelor of Science (Geology)  
Master of Earth Sciences | $75,000 — $130,000  
Project Engineer:  
$85,000 — $140,000  
Principal Electrical Engineer  
$175,000 - $185,000  
Mining Engineer:  
$125,000 - $199,999  
Source: Jan 2012  
www.mycareer.com.au |
| Geological:                  | Investigate the engineering feasibility of planned new developments involving soil, rock and groundwater | Bachelor of Engineering (Electrical)  
Master of Engineering (Electrical)  
Bachelor of Engineering (Civil)  
Master of Engineering (Civil)  
Bachelor of Engineering (Mechanical)  
Master of Engineering (Mechanical)  
Master of Energy Systems  
Bachelor of Engineering (Chemical)  
Bachelor of Electrical Engineering  
(Swinburne)  
Bachelor of Science (Geology)  
Master of Earth Sciences | $75,000 — $130,000  
Project Engineer:  
$85,000 — $140,000  
Principal Electrical Engineer  
$175,000 - $185,000  
Mining Engineer:  
$125,000 - $199,999  
Source: Jan 2012  
www.mycareer.com.au |
| Environmental Scientist      | Developing ways of minimising harm to the environment, based on the study and assessment of processes, environmental legislation and physical, biological, social and cultural environments; Monitoring and evaluating the environmental and social impacts of engineering projects and development activities | Bachelor of Applied Science (Environmental/ Chemistry)  
Diploma of Surface Operations Management | Junior:  
$60,000 - $80,000  
Senior:  
$70,000 - $100,000+  
Source:  
<table>
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<th>Relevant Education &amp; Training</th>
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| Geoscientists| May specialise as a Field/Exploration Geologist, Geochemist/Mineralogist, Geomorphologist, Hydrogeologist/Hydrologist, Mathematical Geologist, Mine Geologist, Palaeontologist, Stratigrapher or a Structural Geologist. Explore specific areas of the earth to determine its structure and the types of rocks or minerals that exist; Study rock core, cuttings and samples and study geostatic and sampling theory. | Bachelor of Science (Geology)  
Master of Earth Sciences                                                                 | Chief Geologist:  
$115,000 - $165,000  
Senior Mine Geologist:  
$90,000 - $135,000  
Mine Geologist:  
$75,000 - $110,000  
Graduate Geologist:  
$60,000 - $85,000  
Exploration Geologist:  
$75,000 - $125,000  
Senior Exploration Geologist:  
$90,000 - $135,000  
| Mine Manager | Develop and execute short term and intermediate term strategies that support growth for the mine operation; ensures strategies are concretely linked to the organisation’s long-term strategy  
Manage the human, technical and operational resources of the mine operation  
Oversee the implementation of the processes, policies, systems and practices within the mine operation that maximise operation efficiencies and competitive advantage | Associate Degree of Mine Operations Management  
Associate Degree of Engineering (Mining)  
Associate Degree of Mine Technology (Mining)  
Bachelor of Engineering (Mining Engineering)  
Source: www.seek.com.au (November 2011) | Mine Manager:  
$210,000 - $270,000  
4.2 The skills base

The skills base for the power industry takes a number of related forms. First, the current skills base of the Latrobe Valley coal mining as well as the generators is one that is precarious, with many having entered the industry as young workers. As mentioned earlier, most of the skilling that takes place occurs in-house with skill requirements in each of the generators and mines specific to that generator, although with some commonalities across the sector. A number of operators, for example, began their career at a base level, such as an ashman, and then over time with experience and on-the-job training developed additional skills have moved on to more complex and responsible jobs. The combination of relatively high levels of remuneration and on-the-job training has been an incentive for many operators to remain at these plants for a decade or longer; as well as recognising the lack of comparably well-paid jobs in the area.

The relative stability of the power generator workforce has implications for training approaches. The stability of the workforce might also be attributed to the commitment of generators to continue to up-skill their own workers to learn how to use new technologies. One example of this process occurs in Loy Yang B which is up-skilling workers as they gradually move to digital systems to monitor generator activities. More examples are evident in other generators. This stability also has consequences for the way employers replenish their workforce. According to one study workplace stability has affected the lack of apprenticeship training which otherwise might take place:

“This is a key issue underpinning the workforce stability, or more accurately, is the key reason for the very low levels of both apprenticeship training and other formal up-skilling processes, other than the strong focus on OH&S and legislative training, including refresher training for plant tickets.”


It is in these circumstances that training and up-skilling have become contentious issues in the industry (see Buchan Consulting, 2005).

Contractor firms, however, are in a different position with a number preferring to buy in skilled workers, when required, rather than up-skilling current workers. For this reason, a number of the employment relationships in contract firms were characterised by a small core permanent workforce and a broader casual and fluctuating workforce depending on requirements and demand for the product. Consequently, a number of the contractors did not commit to up-skilling their workforce in a comprehensive or regular way.

It is also important to note that skills and knowledge gained in the industry is less commonly aligned with national competencies. In the tables (Tables 2 and 3) which outline the skills and roles in the industry, there is a listing of possible qualifications, such as Certificate III in ESI Generation (Operations), Certificate IV, Diploma and Advanced Diploma in Process Plant Technology. It should be acknowledged that although these qualifications are available to the industry, there is little evidence that many workers are qualified in these national accredited programs. Of note, two generators are now undertaking Recognition of Prior Learning (RPL) for some of their staff although on a relatively small scale. At the same time there are a range of other skills which many workers bring to their roles. Some workers may be qualified engineers, electricians, panel beaters, welders or fitters and turners. Some of the qualifications they gained may date back to 20 years ago when the SECV was renowned for an excellent apprenticeship program.
While many workers may not have recognised qualifications, their skill level should not be underestimated. As mentioned earlier in the report, a lack of qualifications might make it more difficult to exactly identify the transferable skills in the industry and therefore appropriate transition strategies, but it does not negate the fact that many of the workers undertake complex and highly technical tasks in their job roles.

Concomitantly, new opportunities are arising in training and re-skilling in the Victorian environment, for example the Victorian Training Guarantee (VTG). This initiative may have an impact upon ‘long term’ development and supply of training for graduates that meet the specific needs of industry. In the Latrobe Valley context, opportunities for workers to re-skill in meaningful in-demand qualifications (i.e. not just ‘forklift drivers’) could be enhanced through a more organised and collaborative approach between industry and the higher education sector. Such an approach is the objective of the Regional Industry Skills Alliance – Gippsland (hosted at the Gippsland Education Precinct). Moreover, Gippsland workers and industry organisations may benefit significantly by investing further in strengthening the connection between industry organisations and Registered Training Organisations.

4.3 Remuneration: Skills or “Golden Handcuffs”

Consultations with industry demonstrated that the apparent discrepancy between skills and qualifications can be attributed to the attractive salaries and wages earned in ‘lower skill’ positions. For instance, often roles such as unit operators are filled by those with engineering qualifications. A qualified engineer working as a unit controller describes his decision to take up a position in the industry that did not require the use of his qualifications this way:

‘At the time the wages weren't good - because it was before the mining boom. So wages were pretty awful, for engineers. I was working as an engineer. I had a job - $40,000 a year I was on and that was a graduate position. The prospects went to about $65,000 and then that was it… That was what an engineer was worth. My training wage at [the generator] was $57,000, right and I had a lot of family in the power industry - I'm from the area - so they always had a career. I had a job for as long as I wanted… So that's why I went that way. In hindsight yeah, obviously I've made the wrong decision.’

(unit controller, 30 years of age)

Still, he was earning somewhere between $114,000 - $130,000 as a unit controller. Such salary levels reflect trends nationally for similar types of work elsewhere.

The attraction for workers to join the generators is the promise of excellent remuneration even at the starting position of Ashman or semi-skilled position. This remuneration can commence at $ 80 - 100K per annum, which then builds upwards over time. In addition, many workers indicated that they had been attracted to the industry, as one of the largest employers in the region, and because it seemed to promise job security, with many in the industry staying in the same business for 20 to 40 years. This tendency to stay in the one well paid job is also colloquially termed the “golden handcuffs” because it is very difficult to find work in the region that pays as well and as a result workers tend to stay in the industry for their entire career. Nonetheless, the salary levels are part of a national trend and partially reflect skills shortages in the local area.
Table 14. Remuneration and career pathways

<table>
<thead>
<tr>
<th>Time frame</th>
<th>Job Role</th>
<th>Remuneration</th>
</tr>
</thead>
<tbody>
<tr>
<td>On commencement</td>
<td>Ashman or semi-skilled worker</td>
<td>Commencement salary $95,000+</td>
</tr>
<tr>
<td>On-the-job training and experience</td>
<td>Assistant Boiler operator / unit operator</td>
<td>$95,000 - $98,000</td>
</tr>
<tr>
<td>On-the-job training and experience</td>
<td>Boiler coordinator/ assistant controller</td>
<td>$98,000 - $100,000</td>
</tr>
<tr>
<td>Significant years of experience after years of on-the-job training</td>
<td>Shift leader/ unit controller</td>
<td>Likely salary $100,000 – $140,000+</td>
</tr>
</tbody>
</table>

As a result, in any form of transitional arrangements, the concern is not just about appropriate transferrable skills but also about the remuneration expectations of workers. This highly paid workforce has been developed over time with strong unionism, a large and successful international employer and has been influenced by the fact that the services provided (that is electricity) is an essential service providing upwards to 90 per cent of power to the State of Victoria.

There has also been much written about skills shortages in regions of Australia (e.g., Buchan Consulting, 2005). However, consultations indicate that the main shortages in the Latrobe Valley and similar regions occur during outage events where 500 – 600 extra workers are required for 1 – 2 months to assist in the maintenance and repair of boilers and turbines. These outages are now less frequent as the industry spends less on maintenance particularly considering that the outages are extremely expensive to undertake as well as the compounding issue of the uncertainty in the market place with the possible closure of some of the generators. In general, the generators employ contractors for this type of outage work and many of the contractors now have strongly held arrangements with the generators – so much so that many are seen as de facto direct employees. Another outcome of the reduced number of outages is the significant loss of employment for contractors.

There has long been a strong demand for jobs in the generators and associated mining areas, with generators as employers indicating that when they advertise for semi-skilled or skilled positions, they will receive over 400 applications demonstrating no apparent skills shortage. However, it should be remembered that the generators are prepared to take on un-skilled workers (and mostly do) and train them on-the-job. The attraction for workers is the relatively high pay and good working conditions even if they are unskilled in boiler operation/ashman work and start at the bottom of the career rung. Power generators also tend to employ technical/managerial workers from other generators in the region who have workers with significant experience in the industry. Jobs are transferable between power generators, although some on-the-job training will be required.

The operator’s job role is best described by the following comment made by an interviewee:

‘Operation means they need and they have full control over running of a 500 megawatt unit, and running it up, running it down based on power needs, responding to emergency. Look, I akin it to a pilot in a plane, you know? When you run up the unit – quite complex, a lot of things going on, a lot can go wrong; then it goes into steady state, running at steady state of 500 megawatts; and when you want to run it back down because you want to do maintenance or you have a breakdown or you get an emergency, you’re fully engaged again. But most of
Job skilling is very uneven. Over recent years, the region has been marked by a lack of accredited training and apprenticeship training schemes. Nonetheless, the region has a very specialised workforce (obtained mostly through on-the-job training) and with few young people entering the workforce to develop the highly regarded skills of the older workforce through training and apprenticeships. As mentioned earlier, some of the generators are now addressing some of these issues via nationally recognised accredited training. However, apprenticeship training, part of the legacy of the SEC, is rarely used as the preferred method of training and skilling workers in the power industry. Some union organisers spoke at length about the gap in training of younger people and are concerned that the highly skilled workforce of the past will mean that the regional workforce will lose some of its reputation as highly sought across Australia. As recent as early 2011, a report developed for the Commonwealth of Australia entitled ‘A shared responsibility - Apprenticeships for the 21st Century’ indicated that there is concern about the lack of apprenticeship training uptake by industry in general.

‘We are concerned that the current rate and patterns of investment in training by employers will not address skills shortages.’

(McDowell et al., 2011: 10)

In addition to the operators and trades employed by the generators for operations, maintenance and engineering, a significant proportion of employees are part of the corporate services which includes corporate strategy, finance, marketing, human services, mining experts (such as geologists, hydrologists), training, environment, risk management and compliance, insurance and administration. This group of employees are generally about 10 – 15 per cent of the workforce in the generators with salaries ranging from $100K to $170K per annum. A typical organisational chart of a generation plant is shown in Figure 9.

![Figure 9 – Typical Organisation Chart of a Power Generator](image)

Some of the generators have also developed Workforce Plans which align with work undertaken by Lepak and Snell (2002) that promotes a system which identifies employment types and their importance to the organisation - knowledge work, job-based employment, contract work, and alliance/partnerships (Lepak and Snell, 2002). This approach of managing human capital has been realised in the Latrobe Valley generators as a more disaggregated industry emerges with the use of contractors to undertake highly skilled work with core critical skills held more closely through direct long-term employment by the generators.
4.4 From Power Generator Companies to Contractors

Since privatization generator companies have come to rely upon contractors to perform a range of economic activities including maintenance of the mine and generation units, emergency services, security, road construction and earthmoving. According to a 2004 KPMG report, power generators contract out 85 per cent of their maintenance, shut-down, mine and facilities management work to contract companies (cited in Buchan Consulting, 2005, p. 56). Many of these contract companies have substantial workshop facilities located both on the generator's site and/or in the neighbouring towns. CPCs tend to have a larger permanent workforce (20-100 workers), rely less on casuals, and employ apprentices directly. Independent contractors are the inverse with large casualised workforces and a small number of permanent employees. If they provide training to apprentices it is often done through a group training provider. These differences reflect the duration and level of work required to perform a typical contract provided to CPCs versus independent contractors. CPC contracts are rarely shorter than 4-5 years while independent contractors would rarely receive a contract for longer than several months.

Planned or unplanned outage maintenance periods, when power generation units are taken off-line for repair, overhaul and upgrading, is when the largest number of casual contract workers are employed. Typically, a workforce of 500-600 workers is required to perform a single outage that can last from 1–9 weeks. Highly qualified electricians, construction and metal workers with specialised skills (e.g. pressure welders, high voltage electrical fitters) are called upon to perform this work. Assembling a workforce of this size and skill level is proving increasingly difficult for many contract companies due to growing competition with other industries and regions for this skilled labour.

'It's been hard to source labour interstate because they're all at the mines and it's even hard to source people around here at the moment due to the fact of desal I suppose, a lot of people down there and they've all gone interstate looking for work because there's no work around here. I've had phone calls today looking for people to go into New South Wales, extra people, they need more people. Their labour is very hard - skilled labour is very hard to find.'

(Senior Manager, CPC Contractor)

The age profile of workers employed among contract companies in most cases tends to be younger compared to that those employed directly by the power generators. The ageing workforce, however, is perceived by many companies as contributing to their difficulties in recruiting workers for outage periods.

The level of dependency on the power sector for a given contractor varies. Most contractors associated with the power industry have business outside the Latrobe Valley power generator sector providing contract work to other Latrobe Valley industries (e.g. Pulp and paper, food manufacturing) and/or similar industries outside the region and interstate including contract work for power industries located in other states. Due to this fact, it is not easy to place a precise number on the number of ‘power industry’ contractors. CPCs tend be the most dependent on the power generation industry and it is not uncommon for CPCs, who are often subsidiaries of multinational corporations, to only be located in region to service the power industry. As a manager for a CPC stated:

'It's probably the same thing as any engineering company up here that's based on the power industry and it was put here for that reason; to service the power industry. Because of the fact that we depend on providing services and products to the power stations.'

(Senior Manager, CPC Company)
Power generation contract companies employ some of the Latrobe Valley's most highly skilled tradesmen in the construction, boilermaking, electrical and fitting trades. According to the Buchan report (2005) contractors employ over half of the skilled tradespersons working in the energy sector. The typical workforce profile of a contract company is described by one senior manager in these terms:

‘Basically here, the majority are tradesmen, so you’ve got Fitters, Machinists, Boiler Makers and then you’ve got admin staff, myself as a Manager, I’ve got a Sales Manager and I’ve got a Workshop Supervisor. So and then we’ve got Field Service, they basically have the same thing, they have a Project Manager, Site Manager and then Supervisors right down the line to trades assistants.’

(Senior Manager, Independent Contract Company)

Many of these workers also hold a range of tickets related to welding, crane driving, rigging and scaffolding. These workers are highly sought after and many have worked for a range of companies and industries. The diverse work histories of these workers reflect the relative insecurity of employment when working for companies whose business activity is tied to contract periods. With exception of Cap’s, most contract companies rely on a high percentage of casual workers allowing for employment flexibility. These labour market conditions contribute to fierce competition among workers for permanent full-time positions with contract companies. Workers securing permanent employment tend to remain with the companies resulting in low labour turnover at this level of the workforce. In recent years, however, as power generator companies have begun recruiting workers in response to a growing number of retirements, they have tended to hire workers previously employed by contract companies. One worker describes his experiences as:

‘I was with the maintenance contractor for 11 or 12 years and then the coal and ash opportunity came up so I applied for them. Got one and been there for the last three years.’

(Coal and Ash Operator, Aged 38)

It is also the case that the generators often appoint new recruits with trade and higher qualifications even though the jobs do not require this level of skill. Some contract companies perceive ‘poaching’ of contract workers, by generators as a growing challenge for them in meeting their skill demands. Many of these workers started as apprentices with their former contract company (for further discussion of the reliance of ‘poaching’ among generators to fill skill shortages within their workforces, see Central Gippsland TAFE, 2004).

4.5 Summary and Key Findings

This overview highlights complex relationship between the organisational characteristics of the industry, the context in which it is situated and the challenges of understanding skill, skill formation and skill utilisation in the industry. In the following chapter, we explore these complex issues in detail through an examination of some of the important themes and findings that emerged from the interview data.
Key findings:

1. Many workers employed by generators have been in the generator industry for ten years or more.
2. There is a discrepancy between qualifications and skills, with many employees skilled, but without qualifications or skilled beyond their qualifications; in other words, skills are not aligned with national competencies.
3. There is evidence that Recognition of Prior Learning is now being encouraged and that new opportunities for training and reskilling are coming into place.
4. There is a complex relationship between skill and remuneration, which in the power generation industry centres on relatively high wages for many.
5. The remuneration levels reflect national trends.
6. Often highly skilled work is undertaken by contractors.
7. Overall there is apprehension about the future, irrespective of qualification, skill and place within the companies that constitute the power generation industry.

Recommendation 9

That steps be taken, possibly by the Latrobe Valley Transition Committee in the first instance, to promote integrated and cohesive policies and practices on skills acquisition, skills recognition and up-skilling for possible emergent opportunities in the overall regional economy of ‘green’ and/or sustainable jobs as well as decent jobs in the future power and coal industry.
5. Emergent Themes

This section identifies a number of emergent themes relating to the power generation industry. This data comes from extensive consultations with generators, contract companies and workers across the power industry. It is objective data in the sense that the analysis is constructed via a systematic analysis of the interview and related material, cross-checked according to informant’s position and place within the industry, as well as in relation to available analyses derived from more quantitative data sources.

5.1 The flexible organisational network workforce

Those directly employed by the generators, both in the mines and the power plants, tend to have the most secure and best paid jobs in the industry. For this reason, jobs within the generators are highly sought after and it is not uncommon for the generator companies to receive hundreds of applicants for an advertised position (see also Buchan Consulting, 2005, p. 3). Apart from natural attrition, there tends to be a very small turnover in the generator and mining workforces. The corollary of this stability is that many in the current generator workforce were originally employed by the SECV and were successful in securing work with one of the generators where they hope to remain until they reach retirement age.

The profile of workers and the nature of work among power industry contract companies is significantly different from that found among the generators. There is a much greater reliance on casual work among the contract companies, due, in part to the nature of contractual agreements with the generators. The duration of contracts vary significantly (anywhere from one week to several years) depending upon the type and level of work required by the generators. These contracts take one of three forms.

- One distinctive form is the continuous presence contractors, companies contracted to perform ongoing maintenance or operational activities, often with contracts that guarantee work for several years thus enabling these companies to employ larger numbers of permanent staff and apprentices. In some cases, continuous presence contractors operate as alliance contractors sharing profits and losses with the generators.

- A second form are the independent contractors involved in a range of maintenance related activities including repairing and maintaining conveyor systems in the mines, construction and rigging related work, boiler and generator maintenance.

- A third variant applies to independent contractors that rely upon sub-contractors for specialised work (e.g. insulation, asbestos removal, industrial painting, etc.). Contracts for this specialised sub-contractor work tend to be of the shortest duration and usually rely upon a casualised workforce.

The profile of the work timetable also influences arrangements between generators and contractors as well as the way contractors employ their staff. For many independent and sub- contractors, ‘outage’ periods, in which the generators are required to undertake scheduled or unscheduled maintenance work of particular generation units and/or its boilers, is when they can receive contracts requiring large numbers of skilled workers. A contract company that is successful in their bid for ‘outage’ contracts may have to employ up to 500 workers to fulfil the work requirements.

Highly skilled tradesmen (e.g. boilermakers, fitters, machinists, etc.), qualified riggers, crane drivers and sheet metal workers as well as trade assistants and site managers and engineers typically makeup the ‘outage’ workforce. The work is well-paid but most of these workers are employed as casuals for the duration of the outage period which may last from 1-9 weeks. With permanent work
increasingly difficult to secure, many casual workers in the Latrobe Valley rely on outage work to support themselves and families. The importance of outage work to the region's casual contract workers and their families was often reflected upon by not only the workers themselves but also the contract companies.

‘we offer them casual work and they get to pick up more hours because of the fact that it’s an outage and they basically work around the clock, seven days a week...these guys are doing 10 hour shifts, six days a week. They get a chance to pick up extra money and extra overtime and there hasn’t been a great deal of that, then you know, men with young families and debts, they need the extra money’

(Manager, Independent Contractor)

This is a form of employment that is sought after because it is short-term, relatively well paid, and casual. It provides an add-on to current wages or a supplement to household income in a region where many residents are hard-pressed financially. Nonetheless, it is also a form of employment that creates skills issues for the power industry in that there is evidence that it is not always easy to assemble an appropriately skilled workforce to deal with such events as outages (Buchan Consulting, 2005, pp. 3 and 70 - 87).

Thus, the flexible organisational network, where in-house maintenance regimes have been reduced following privatisation, constitutes a set of arrangements whereby the generators and mines have a relatively stable workforce, at least for the moment, and where key activities are contracted out, often in circumstances that rely heavily on a large casualised and temporary workforce.

5.2 Current skills and employment

The generator power industry workforce has a core of workers, usually directly employed in the generators and mines, who are long-serving, skilled and with the result that there is a low turnover within the generators. Overall the workforce, in the generators and the contract firms, is recognised as a skilled workforce.

The energy sector in Victoria is a major user of trade skills. Nearly half the ‘trade qualified’ workforce (47 per cent) completed their training before 1985 and less than a tenth (8 per cent) completed their training after 1998 (Buchan Report, 2005, p. 52). Nothing has happened since to change this picture. Nonetheless, it does mean that in a core of the energy sector, generation, it comprises an experienced, qualified and skilled workforce.

A distinctive feature relating to this workforce is that there is a relatively widespread recognition by industry figures that the power industry in the Latrobe Valley has a skilled and specialised workforce. As stated by one manager at a generation plant:

‘We have some very skilled people in a lot of different areas. Our technical expertise here is quite amazing when you consider the years of experience and the number of people that we have.’

And, there is an assumption that these workers can secure work elsewhere.

‘I'm sure that most of the people here would be able to find work using the skills they had somewhere but I don’t know that it’s going to be here’.
Such observations are also made by others in or connected to the industry and the region.

‘The notably skilled workforce in the Latrobe Valley is highly sought after in other parts of Australia – hence the fly-in-fly-out workforce which has begun to emerge.’

(Union Branch Organiser)

Others, both employers and the workforce, also observed that the contractor workforces are also generally well regarded and also often sought after throughout Australia.

It is important to note, however, that the prospects for finding work outside the power generation sector are significantly different between trade qualified workers and those who pursued a career as power station or mine operators; many of the latter have no formal qualifications. The prospects for power station and mine operators to find work outside the sector are highly limited and some expect to encounter some difficulty in transitioning to a similar job in another power station due to their specialised on-the-job training and the technological, organisational and job specification differences between power generation plants. In most cases, power station and mine operators have highly specialised skills which have been developed ‘on-the-job’ with the generators preferring to train their staff in the particular nuances of each business. This professional development is typically non-accredited training which means that many of the skills learnt on-the-job do not easily and clearly demonstrate transferability. Nonetheless, these are not new concerns and the generator companies indicated such a situation in 2005 (Buchan Consulting, 2005).

A fairly common career progression and training experience among power station and mine workers is described by a unit controller in these terms:

‘I'm a unit controller....basically I got a job with SEC out of Year 11 some 24 years ago. I did a four year traineeship which lead straight into an operations position. I started as a unit attendant and I've moved up through the ranks, to assisting unit controller, unit controller and relief shift manager....I've got a Certificate of Technology - Power Plant which is probably equivalent to a certificate in needlework. It really means nothing. It's not a recognised qualification, basically. It was something the SEC put us through...it was a course designed to make career operators’

(Unit Controller aged 42).

When reflecting upon their prospects of finding work with other power generators uncertainty was commonly expressed by mine and power station workers:

‘you're more or less trapped, or confined to the generational power station industry...a lot of other guys at the power station they've been trained up to be operators and if they did have any skills originally, I think they've faded away somewhat’

(Power Station Operator, aged 63).

One reason that was frequently given was the absence of qualifications, or at least relevant qualifications.

‘If I wanted to go to a gas-fired power stations or one of the generators- my qualifications wouldn't get me in anywhere else. So, it is - you're trained for that job’

(Coal and Ash Operator, aged 38).
In addition, the work tasks undertaken by some workers were seen as no longer relevant, and as a result, these workers felt they had a limited future. Moreover, this type of work experience was seen to be a problem by others in the industry:

‘.coal and ash operators, they’re just going to be left out in the cold...These guys get out on the shovel and hose every day and work hard and there’s just not that much call for that in the modern industry’

(Unit Operator, aged 45).

If confronted with job loss from the closure of one of the power stations, most felt they would only be able to find comparable work with another power station. In the event that it became possible to make the transition to a different power station then most workers felt that they would need some level of re-training and up-skilling.

‘The main issue will be ....our lack of technology...We’re not familiar with all the new control interfaces and yeah, we’ve got some digital control systems (DCS) now in stage one but not everyone is working with them and all the other stations have got the DCS. So obviously while we are really, really good at the basics and the understanding of operating a machine, because we could run a machine up manually without any auto controls and be able to do it very well, which I doubt many of the other operators in the new station could because they rely quite heavily on their automatic control systems but we don’t have the understanding of their control systems....So we are technologically backward in that regard...I think that would be probably the main stumbling block

(Unit Operator, aged 45).

The prospects of securing jobs within and between generators has become more difficult because of changed recruitment policies, by each generator company, reducing the prospects of relatively easy movement between plants. Middle-aged generator workers, who had entered the generator workforce without being expected to obtain such qualifications, expressed concerns about this perceived change in recruitment among generators and feared they would not be able to compete with trade qualified workers if they were retrenched.

‘Our average age [of the generator workforce] would probably be up near the 50 mark so most people are a bit nervous. Especially the ones that haven't got a trade background and have been in the industry all their lives.’

(Operator, aged 51)

This is an industry where the workforce, in the generators and mines, as well as in a number of the contract companies, is nervous about the future. Many workers are skilled but not credentialised; many are older workers and many of the younger workers are very apprehensive. While employers have recognised these concerns, often in specific and often in uneven ways, the absence of an integrated approach to deal either with up-skilling or any transitions and relocation that may occur within the industry or beyond is seen as a major problem by most workers in the industry.

However, as mentioned earlier, there is now a changing culture with at least two of the generators providing the opportunity for their workers to apply for Recognition of Prior Learning (RPL) and undertake additional training to ensure that basic qualifications are being developed and nationally recognised qualifications are gradually on the rise amongst these workers. This aspect came up in discussion with generator managers, who spoke of the on-the-job training model whereby workers will be employed as Ashmen (often with a trade background – ie. panel beaters or car mechanics),
for example, and then are gradually trained to develop more skills and experience. Some generators are also focussing on cross-skilling their workers to provide greater flexibility for their workforce.

In the case of non-operational staff i.e. management staff, including human resources, finance, technicians and IT staff and corporate staff, there was also recognition of the problem of displacement. One manager stated:

‘...I know for me if I were to leave my role here at [.....] and get another job within the Latrobe Valley, I wouldn’t get paid what I’m getting paid now. So, I’d probably need to go to WA to get the sort of money that I would be getting here’.

(HR Manager)

The majority of these workers have higher educational qualifications. These qualifications and their skills in relation to their specific jobs mean that they are likely to be readily transferable into other industries. Nonetheless, they also face problems because of the national trends in these types of industry. Those interviewed suggested that they would be able to use their skills elsewhere but they also indicated that this might require a move out of the area, in some cases interstate.

5.3 Ageing and life cycle factors

Ageing and life cycle factors have a major impact on workers’ attitudes towards skill development, recognition of prior learning and retraining. They also have an impact on attitudes towards retrenchment and retirement, future employment, out migration and employment on a fly-in-fly-out (FIFO) basis. These factors play out differently amongst workers from the power generators and those employed by the contractors.

Power Generators

The age profile of generator employees is weighted towards older workers and comprises clusters of age groups, according to recruitment. The ABS census figures show that the age structure of the power industry in the Latrobe is highly skewed, with a high proportion of workers aged over 45 and an average age of 45.2 years amongst men employed in the sector. The evidence from both employers and workers from the power generators is that this pattern is even more accentuated amongst their particular workforce. One outcome is that the workforce is a stable one. Employer representatives acknowledged that they have had a very stable workforce and that in fact turnover rates of less than one per cent are ‘unhealthy’ for the organisations. Examples were provided of employees who continued to work in the power generation area well into their 70s.

The age profile is structured by the distinct waves of recruitment that have occurred since privatization. This feature of recruitment has led to significant gaps in the age structure of the workforce. Such features are noted by workers, when they reflected on the age profile in the industry. As one worker observed:

C: There’s a big hole there because basically I came in at their time when they - not long before privatisation and they just weren’t employing new people.

The workforce is clustered according to intake, so:

B: You’d be one of the last and I was one of the first of the new lot, basically.
The gap between intakes is as great as fifteen years.

_B: So six years ago was the first intake since the 1990s. It's just too big a gap. It's like 15 years of not employing anyone._

_(B. Power Generation Worker aged 30 C. Power Generation Worker aged 42)._  

With such a pattern of recruitment, there is a clustering of experience and particular sets of qualifications.

These patterns also impact on the community as a whole, as indicated by other workers and union representatives. The lack of employment and training opportunities for particular cohorts of workers within the region is perceived to have contributed to many of the social problems within the community, including high suicide rates and incidence of domestic violence (see Birrell, 2001).

_‘Yes, that’s the problem, because what’s happened is, we’ve had a 20 year void where there should have been thousands of tradespeople come out that haven’t come out. All the people that had the capability – and probably there’s still people there, but not what there was… it has been one of the – that’s all the other problems that we’ve had here – it’s been one of the biggest wastes in this area.’_

_(Union Representative, Power Generator)_

The recent history of the power industry, since privatization and the current prospects of the industry in relation to transition mean that many see the power industry as providing limited employment opportunities in the near future. There was a view that the restructuring of the power industry in the Latrobe Valley would have a severe impact on younger generations which are looking to enter the workforce in the next ten years, continuing the cycle of social problems within the community.

_Older worker: [My son]… and all my grandsons won’t have a job here so they’re gone anyhow. That’s where the real issue is and ensuring, I don’t know, they have something for them. It’s not necessarily having something for me._

_The power industry was no longer seen as a likely place of employment._

_Son to his father: Your generation is fine. They’re going to retire and they’ll be all cruisy, and we’ve got blokes saying that, it’s all good for me, yeah, I’m okay, as long as I stay the next five years, it’s all tops._

_VIEWS ABOUT EMPLOYMENT IN THE INDUSTRY HAD BECOME SHORT-TERM._

_Facilitator: But that then knocks onto your children, that uncertainty?_

_Son: They’ll be looking for work elsewhere, and before you know it, the community is moving away._

_(Power Generation Workers, aged 63 and 38)_

There was a general view that the next generation of employees will not only have to look outside the power industry, but indeed outside the locality itself.

_These views carry over to an assessment of the importance and desirability of training. Older workers, aged over 55 appear to have little interest in retraining, or even recognition of prior_
learning, despite a willingness to continue in employment for another 5-10 years. They express a number of concerns,

‘Fifty six, nearly 57, getting old and I work in [Generator]. Been there, in January 2012 it will be 30 years. I stopped new training probably about 15 years ago so I’ve stayed, instead of going up’

(Power Generation Worker, aged 56)

Training was increasingly seen as an optional extra by the older workers. They pursue training so as to place themselves in line for promotion; otherwise there was little interest in training. They did not see re-training as a viable option for themselves.

‘Why go training a 55 year old bloke to do something that he’s realistically never going to use. Training's not cheap; it costs money to train somebody. That money could be better spent somewhere else.’

(Power Generation Worker, aged 56)

As is often the case with large employers in relatively stable industries, such as power or other utilities, employment does not necessarily turn on formal qualifications (other than schooling). Many workers acknowledged that they have never undertaken formal qualifications or training. Having left school at 15 or 16, all their subsequent training has been on-the-job, task-oriented and specific to their roles within a particular generator. Even the process of documenting their skills knowledge and abilities for recognition of prior learning is daunting.

‘Well you’ve got to provide proof of your recognition of prior learning which is really hard. It's hard for a certain skill set. You’ve got to speak the jargon and know exactly what they’re after to be able to prove that you do have those skills and it’s all doable. I have no doubt but some of it was back to school, hit the books, all of that sort of stuff which is really too hard. Yeah, so … I think to maybe 30 people or so they gave the opportunity for people that wanted to do it and quite a few of the younger people have taken that up although [but] it is a huge undertaking to do that.’

(Power Generation Worker, aged 45)

As the future of the industry becomes more uncertain, many workers will begin looking to have their skills formerly recognised. There is evidence that at least two of the power companies have begun to implement a process of recognising prior learning. Nonetheless, for these workers, the thought of returning to formal training, combined with the issues around maintaining their household income whilst retraining seems an insurmountable barrier. For others the issue is that even if they undertake retraining, they will face significant age discrimination in the labour market.

‘If they’re willing to take on people like me, that would be fantastic you know. The current trend of the people they have hired on have been younger. So it hasn’t been very inspiring to see who they’re employing and what skills they’ve actually had compared to me. I feel like I would be a good asset but well the trend is not to take people in their 50s...’

(Power Generation Worker, aged 56)

Older workers in general were pessimistic about gaining alternative employment in the region, and certainly not at the levels of remuneration that are still available in the industry. Training into other jobs was seen as problematic:
‘By the time I've done a training course or you know, if they put me through something at that stage, I'm then 53, 54, something. I know my father was retrenched at a late age and he couldn't get any work at 55 plus.’

(Power Generation Worker, aged 49)

Prior experience had taught these currently employed older workers to be pessimistic about alternative employment. For those who do not wish to continue working, the regulation of superannuation schemes presents a significant barrier to a departure from the workforce.

‘Retire. Well it was always going to be 55 but with the way that superannuation law changed and I was in that wrong age group, where I just missed out on being able to do it at 55 or some can retire at 55, 56, 57 et cetera 60. If I got to 60 I'd be right. No worries. But this place closes, yeah, a different kettle of fish.’

(Power Generation Worker, aged 42)

Hence, the rules and regulations about superannuation and related matters also underwrote a commitment to continue in waged employment.

Another prospect for these workers is to use their skills where they are recognised, namely in other parts of the country, particularly in the resource sector. For many this is labelled ‘Fly-in-fly-out’, so that other household members remain in the locality, while the former power employee seeks employ elsewhere. However, workers in the over 55 age group do not see themselves taking on FIFO work, nor would they leave the Valley if they were made redundant. This raises issues about the impact of ageing within the community.

Some workers had begun to prepare for the uncertain future. They, nonetheless, saw themselves remaining in the area and continuing to contribute to it.

‘50 people - and I would say most of them would be retirees - they've no intention of leaving the community. Most of them are on good money. They'll still be most probably be drawing from their super, so similar amounts of money from their fund, going forward. They won't be selling their house. Their money is still coming into the community, but via a different avenue, from their [super]… it would be a community of just retired people, because no younger people would [stay].’

(Power Generation Worker, aged 63)

The problem seen by many is that younger residents will be ‘forced’ to leave the area because of a lack of employment opportunity.

Perhaps the age group that felt most beleaguered are those in the 40s and early 50s. Many of the concerns expressed by the over 55 year olds are shared by workers aged 40-55, particularly around age discrimination and returning to a training environment after so many years away from institutional learning. While more of these workers have completed more formal study than their older workmates, they still express concern about returning to formal studies at this time in their lives. Nonetheless, many workers in this age group have taken steps to have their prior learning recognised and to achieve nationally-recognised accreditation of their skills. They still expressed scepticism of how transferable their skills may be to other power generators or to other industries or occupations.
One dilemma was that most of these workers had never been employed outside the power industry. They were nervous about the future, for example, what they would have to do to prepare for job seeking, how their skills might be recognised and so on.

‘It’s difficult to say. I’m not too sure. I’ve never gone for a job interview outside of the industry. So it’s a bit hard to relate to how well other industries would accept my managerial [skills]. I don’t have any accounting or very basic managerial, it’s basically on job training we do. So you’re just put into the position and let go. So you’d like to think they’d take some of that into consideration but I’ve got no qualifications in anything but power station and I’d have to try and relate some of the tasks I do in that to anything outside.’

(Power Generation Worker, aged 47)

These workers did not know how they would be viewed by other employers. They were unsure that they had transferable skills.

Further, workers in this mid-age bracket are more likely to have young families tied to local schools, and spouses with careers in the area. They are also likely to have mortgage responsibilities. A major anxiety expressed was related to the need to maintain their household income during a period of retraining in order to provide stability for their families.

‘Well, I'm going to need an income while I retrain. I'm going to need to retrain. If we have to move - it's not just me who needs support now. My partner's just lost her career because of it. My house price has just crashed. I've got to sell a house and move to another area. Relatively cheap housing here. So I'm going to lose money and have to move somewhere where the housing is twice the price… So it's not just the job now. It's my entire lifestyle and my - everything that they are taking away from me. How do you fix that?’

(Power Generation Worker, aged 38)

These were problems that go beyond the individual worker; they are dilemmas and difficulties for households.

Another common theme was a fear that the value of the property market would decline with the closure of one or more power generators. The workers worried that their choices would come down to accepting FIFO work or uprooting their family and losing property value by moving out of the Latrobe Valley to seek employment.

‘I wouldn't want to, no. I’d rather stay locally and stay in the town. My kids are here, my wife’s here. I don’t want to be flying out and stuff but, at the end of the day, I've got a house loan and everything that I've got to pay for, so I've got to do whatever I've got to do. To me, it'll be very unfair to - and it would be stupid of the government to force Victorian communities to go and bloody work inter-state. It's just stupid.’

(Power Generation Worker, aged 38)

There were strong sentiments that not only were employees tied to the area, through mortgages and the like, but that the government could do something to minimize the pressures on residents to move. Nonetheless, these were general sentiments with little specific suggestion as to what a government could actually do.

A universal view was that it was all very well to have access to training but without industry development in the Valley and new jobs growth, training alone was not going to solve their problems.
‘Well the thing is this, is that you can have all the qualifications under the sun. If there's no employment down here, there's no employment... We'll end up behind the counter at bloody 7-Eleven...’

(Power Generation Worker, aged 50)

There were no commensurate jobs in the area, particularly in relation to remuneration.

‘What did someone say? No point in being the highest skilled person on the dole, yeah.’

(Power Generation Worker, aged 50)

Without job opportunities, skills were considered to be somewhat redundant, or at least this is what many thought.

Workers in this mid-age group felt that if they were made redundant they might consider stating their own business, but were unsure of the type of assistance they might be able to access to support this aim.

‘Oh look, I'm too young to retire but just if they said look, here's some money to assist you into doing whatever you're going to do, well I'd try something. You know what I mean? I'm not going to just sit at home and do nothing. I've got to try to make an income, whether it's start my own business or do something like that I don't know, but...’

(Power Generation Worker, aged 50)

These workers were in a quandary. They often did not have recognised skills. They often were financially committed to the area, and emotionally committed. But they also had aspirations, and dreams, and setting up a business was one of them, although history cautions against optimism in this respect.

Amongst the power generation workers, there were very few aged under 40. Those that did fall into this bracket had completed a higher level of schooling than their older workmates, but had still primarily completed on-the-job training. They were eager to seek nationally-recognised accreditation of their skills, including recognition of prior learning. These workers were very supportive of strategies that would allow them to retrain as tradespeople while maintaining their existing wages.

With less likelihood of having families and property investments in the regions these workers were slightly less anxious about the possibility of having to accept FIFO work or migrate out of the region to find work. However, this would not necessarily be their first preference, and they acknowledged that their departure from the region could have an impact on their families and the broader community.

Interviewee 1: You've got to do what you've got to do. I've got a sick brother so I'd rather not leave if I had to. A girlfriend and stuff like that. But you've got to make a living, don't you?

Even so, others knew that FIFO was tough and hard to manage.

Interviewee 2: We've all got - know people that have done that through the privatisation that decided to go up to Queensland and try their luck. I reckon probably all, from the
guys I know that have done it, 80 per cent of them have come back with their tails - it hasn't worked and they're broken.

As implied the costs are high and many spoke of marital breakup and related hardship. As stated, couples struggle, they end up:

Interviewee 1: Single.

(Power Generation Workers, aged 28 and 50)

Overall, the power employees face an uncertain future. They are an old workforce, seemingly locked into relatively high paid jobs, with limited recognized skills and tied to the area. For these workers, the prospects are daunting.

Contractors

Broadly speaking, the age structure of the contracting workforce is the obverse of the power generator workforce, with a small proportion of workers aged over 55, a similar proportion of workers aged 40-55, and more workers aged under 30. Within the Latrobe Valley region, this pattern differs from the age structure of casual and contract work for men across Australia more generally with an increased proportion of mid-aged workers than is seen across the general population.

The contractor workforce face similar lifecycle issues to those in the power generators, however there are a number of issues that are specific to contracting work. Given that the contract workers tend to be younger, and have spent more of their career actively competing within the labour market, they tend to be more resilient and accustomed to transition and change. Having held many short-term jobs and contracts, these workers are familiar with the processes of searching for new work and of promoting themselves and selling their skills. As a result they are more likely to have confidence in their existing skills and be more self-aware about the skills they would like to develop and the type of training they might need in the future.

For contract workers aged over 55 a career of short-term contracts and casual appointments has had an impact on their superannuation and savings. These workers may need additional government support to facilitate retirement.

These workers might be expected to have achieved a level of financial security in owning their own homes and not having dependent children. However, this may not be the case for all. With the increasing trend of young people continuing to be supported by their parents into their 30s, some older contract workers may have an ongoing role in supporting their adult children.

Facilitator: Do you have children?
Interviewee: Yeah two.
Facilitator: How old are they?
Interviewee: 25 and 19.
Facilitator: Are they in the area, have they stayed in the area?
Interviewee: Both and the youngest is still at home.

(Mining Contractor, aged 57)

These workers may be happy to continue working on an ad hoc basis as a transition to retirement.
‘I started with Boom because it’s a good fit for me. I’m 50 years old, so it’s like - even in the casual capacity I get two or three days a week, I’m happy.’

(Contractor, aged 50).’

As contractors, these workers have experienced multiple jobs and extended periods without work. They seem to be resigned to a world in which jobs and work comes and goes, but they continue to see themselves as the key to their households’ survival.

‘Because I’m the primary breadwinner, I sort of got one eye looking at what’s going to happen in the future and how long before it affects me and another eye in the present, work out just to get through’

(Mining Contractor, aged 57)

There is no evidence that these older workers would seek to retrain, take on new careers or even move into different occupational tasks. They are unlikely to move out of the region or seek out FIFO work. As their traditional work and employment declines or disappears within the region, their quality of life, and that of their households will decline. For these workers their ongoing participation in the workforce will depend on the development of new industry sectors within the region, that draw upon their existing skills, knowledge and ability.

Contract workers in the mid-age range tend to have a more active engagement with training and development. Acutely aware of their peripheral status in the labour market, they seek out a range of qualifications and tickets (rigging, scaffolding, welding) both at the semi-skilled and skilled level. Some contractors have undertaken training out of work hours or between contracts in order to improve their chances in the labour market or to further their own particular interests. For many workers, the diversity of their skills is perceived as their greatest asset in times when there is a downturn in employment opportunities.

A number of workers identified that they had undertaken a trainer's certificate to enable them to become a certified trainer. They suggested that such work might be complementary to ongoing short-term work within the sector, but might also allow them to transition into a more permanent position in another industry.

‘I did a Certificate IV in Workplace Training and Assessment. Done that off my own back just to have something as a bit of a fall back.’

(Mine Contractor Operator, aged 41).

For these workers, the issue of funding for training was crucial. Many have paid for the training out of their own pockets, and undertaken the training in their own time. However they would like the use of these skills in the workplace to be recognised through appropriate pay increases or allowances. They need to make a case to their employers to both recognise these skills they have attained and the increased productivity that they can build within the company. All too often the skills have not improved either their job security or their pay. This ongoing issue could contribute to a loss of faith in the importance of training.

Amongst the mid-aged workers there is certainly a more general confidence in their own skills, knowledge and abilities, but also a greater confidence in the accreditation of skills and in the importance of training more generally. These workers may make a transition to different industries and occupations more easily than similar workers who have only ever worked with a particular power generator. It should be noted that many of these workers are already in a position in which they could choose to accept short-term contracts in other parts of Australia, or accept FIFO work.
And yet the majority of workers interviewed had chosen not to go down that path due to their family commitments and extended ties to the community.

Along with the direct employees in the generators, these workers were particularly resistant to the idea of taking fly-in-fly-out work or employment in other parts of Australia due to the stress this would place on their families and relationships.

‘I’ve got a wife and two kids. One starts secondary school next year, the other one is in Grade 6 next year. So they’re at the age where you can’t go uprooting them. Plus my wife’s family - my wife’s grandmother is elderly. I’d go back to Western Australia but I have family commitments and everything here. It’s a bit hard.’
(Mine worker, Continuous Presence Contractor, aged 41)

These workers were aware of the emotional costs of FIFO, as well as the burdens that are left behind in the area, in relation to dependent or aging parents or young children, increasingly living in rather challenging environments.

Younger workers, aged under 40, were quite plentiful amongst the contractor workforce. For these workers, peripheral employment was their only path into the labour market. They were willing to accept a range of short-term or casual assignments across the industry sector in order to develop a range of skills and experience. They are willing and eager to learn and are frustrated by the lack of both on-the-job and structured training opportunities provided by their employers. Once again, their persistence in staying in the region and accepting only peripheral positions within the labour market, despite the potential for improved access to training or higher rates of pay outside the region, demonstrates their embeddedness within the community and the importance of family and community connection for these people.

But, this was not a feature of the young. Older workers were prepared to draw on their own resources, such as houses to stay put.

‘So our position - like I say, we own our house and all that sort of stuff, so we’re in a position where we can weather these petty storms… I would say that maybe 30 per cent of the people may be in that position around here.’
(Mine worker, Continuous Presence Contractor, aged 50)

Nonetheless, not all were in this position, particularly among the contract staff, where pay was generally less than in generator employment.

A consistent theme for all of the workers, regardless of age or life-cycle phase, or type of employment, was that FIFO and out-migration were options of last resort. Their commitment to the region, to their families and to the community must be recognised in any government response.

5.4 Connection to place

The history of the region, in particularly the privatization of the SEC, still plays a significant part in the local ‘zeitgeist’. The large scale job loss during the 1990s and its aftermath left a sense of anger and frustration about the approach taken at the time. There is a stated determination by many that all parties, including the workers, the generator management, the government and the unions will work together to manage change, to ensure a more ‘just transition’ in the future.
The SEC had seen the employment of families as part of its tradition and approach. Grandfathers, fathers and sons knew that they were part of a long held tradition of working for the State to ensure the security of electricity supply. As a result, the workers had a sense of loyalty to the power industry in the past. It has been said that the SEC shaped an industrial landscape and forged a region.

Since privatisation, there has been a shift in the way workers relate to the industry. The relative stability of the workforce is due to high salaries and good working conditions rather than loyalty to the power generators. However as a result of a reduced maintenance regime by the power generators (ie., fewer outages and other maintenance work carried out in-house), many contractors were effectively forced to look elsewhere for work in the area, but often elsewhere in Australia. This development in the late 1990s and early 2000s created a fly-in- fly-out workforce that may eventually have a less favourable effect on the region through skill leakage, lack of social cohesion, reduced investment and eventual migration from the area.

There may be a temptation to assume that those working as fly-in fly-out workers have chosen to do so because of the attraction of highly paid employment for example in the mining sector in other parts of Australia. While numbers of workers have been forced by occupational and personal circumstance to seek work in other parts of Australia on a fly-in fly-out basis, the constraints become more pressing when the analysis is shifted from the individual to the household:

‘For some skilled workers, the availability of employment opportunities for spouses or children is as important as personal opportunities (Miles et al., 2004; McKenzie 2003). Many workers are unwilling to relocate unless employment opportunities are available for spouses, particularly if that spouse is also a professional.’

(BTRE, 2006: 11)

Research indicates that these workers are more often than not less satisfied with their work and resulting family arrangements than workers who in the past had been able to find local, stable, and well paid employment (Miles et al., 2004; McKenzie, 2003).

The discontent with mobile work arrangements is also associated with a sense of place. In research undertaken by Falk and Balatti (2004), the concept of place is closely tied to a person’s identity and their sense of self development via experiences, friends, family and the surroundings. This sense of self may be threatened if relocation for employment is required. Over the past 3-5 years there has already been a shift to reduced contract work. Often when speaking with locally employed workers, a sense of pride in the region is expressed. Further, in a number of interviews it transpired that many have either lived here all their lives or returned to the region after time elsewhere. In addition to concern about job security, a number of workers indicated concern for the local economy, citing house values falling, declining retail sales and a general sense of community dissatisfaction about an uncertain future. In many cases, these observations and considerations were a reflection on what occurred in the 1990s when privatization of the SEC took place. There was a unanimous desire that there is not a return to those days.

To counteract these concerns, one of the union organisers strongly recommended that the region should be viewed as a whole, with strategic plans developed for all industries in the region and not just the power industry. Such an approach would facilitate growth and certainty for the region particularly if resources were available to support the strengthening and development of existing and emerging industries. Nonetheless, such a view is neither unusual nor confined to one section of the community; similar sentiments were expressed also by policy makers and business
interests. They also inform a number of the policy statements about the Latrobe Valley region and surrounding environs (eg., ClimateWorks, 2011; Latrobe City Council, 2010).

5.5 Transition Expectations and Responses

The transition away from dependence on coal power generators in the Latrobe Valley will see significant changes for workers, households and the region. Strong views about the likely outcome of a retirement of one and possibly two of the generators in the Latrobe Valley were frequently expressed by those interviewed. How best to minimize the perceived impact of generator closures on the region’s workers and companies were often spoken about.

In discussion with generator management, contractors and employees, there is an expectation that the move away from coal fired power generation will be managed with greater planning, more resources and a more equitable outcome for all than the last major change in the region – privatisation of the SEC. It is apparent from our research that there is a certain apprehension around the process of decommissioning two of the generators in the region and the effect this may have on the local economy and the workers livelihood. The stories of privatisation of the 1990s still reverberate throughout the community and the process by which this was managed left the community in a significant disadvantaged state.

Job losses are already being felt by some contract companies as generators reduce their level of work they have traditionally sourced from independent and sub-contractors. As one independent contractor stated:

'We used to get an enquiry here [from power generators] every one to two days, some sort of enquiry, and they ranged from four or five hundred dollars over the year, to two to three million dollars’ worth of work once. Once they started talking about this carbon tax, we haven’t seen any enquiries. We did get work on the other hand, but only work that was crucial, breakdown work and work that they had to do.'

(Senior Manager, Independent Contractor)

Even CPCs expressed a growing loss of revenue and growing uncertainty as the generators began taking steps to reduce costs.

'At the moment there’s cutbacks in terms of expenditure in the mine and in the station. There's some rearranging going on in terms of responsibility and maintenance….it's really a changing thing at the moment whether the mechanical maintenance responsibility is going back to the customer is now a bit of a worry…But that's really not something that we're in control of.’

(Senior Manager, CPC Contractor)

The responses of contract companies to this situation are varied. Some have cut their use of casual contractors while others have had to make deeper cuts and reduce the numbers of their permanent workforce. Only a few companies expressed a view that they would be forced out of business or need to relocate. Most sought to acquire additional contract work outside the industry to make up for lost business opportunity from the power generation industry. Some sought to maintain their level of business activity through picking up additional work interstate, such as in the mining regions of Western Australia.

'we've actually got a bit of an action plan at the moment, where we are now looking outside the Valley. You know, we are basically targeting anything, any industry.'
Companies securing work outside the region typically expected Latrobe Valley workers to assist them in performing this work. As one contractor stated:

'Whereas at one stage they were all sitting out there [a Latrobe Valley Generator] and going home every night, now they've got to move around the country just to stay employed basically.'

(Manager, a former CPC Contractor)

The duration of interstate work visits vary from a few days to several weeks. According to many contract workers and contract companies in the Latrobe Valley this situation has contributed to a situation in which 'you can go just about to any construction site in Australia and you'll come across someone from the valley' (mine operator, 41 years of age). Some of the contract companies are also seeking to bring some of the required maintenance work back to their Latrobe Valley workshops. For the most part, these companies are seeking to continue performing the same or similar lines of products and services drawing upon their existing skills profile rather than venturing into fundamentally different types of areas. Few saw a need to re-skill their workforce under this business approach. It was not uncommon, however, for some contract companies to be exploring the possibility of offering different types of products and services not far removed from their typical line of work such as moving into industrial painting and away from a reliance on asbestos removal or insulation type work. One company had made the decision to move into the training field by offering training to other companies.

'So we're actually creating trainers out of our guys that can go to places like, for example, Lihir Gold in New Guinea and train workers on those sites. So some of the older guys who perhaps want to take a little bit of a step back from the tools can get involved in doing that sort of thing. So it gives us another option for those people moving forward.'

(Director, CPC Contractor)

In addition to the work of contractors and other employers in adjusting to the changing environment, there are a range of other initiatives being taken by local government, community groups, farming organisations and trade unions in managing change. Union leaders, for example, are working towards assisting workers in discussions about a “just transition”. They remain positive about the process and recognise the importance of the Commonwealth government’s “Clean Energy Future” and the need to act on reducing carbon emissions through a carbon tax and eventually the carbon trading scheme. However, there is still a level of uncertainty about how workers and their families will be assisted to manage the process of change over the next 5 – 10 years.

For workers, there is an expectation that the process of change will need to be managed more socially responsibly than during privatisation. There is a concern that 're-training' schemes will be the dominant approach to assisting workers. As one worker stated,

'If they're going to do something, they've got to make it meaningful what they do, not just schemes that look good on paper.'

(Mine Operator, aged 41)

Others worried about how their families would survive if they were retrenched and they had to be re-trained.
'The level of training I require is four years of a trade school and an employer and not have my wages cut dramatically, so I can still service my finances. That's the level that I need. Now is the government going to be doing that? Four years to support me? At my wage, while I train. Because I've got to go back to minimum wage to become an apprentice and I've got four years. I'll lose my house.'

(Unit Controller, 30 years of age)

The importance of new investment and new job opportunities were stressed by nearly every worker. The critical relationship between re-training and new jobs was a constant theme.

'You can train for whatever job you want but if the jobs not there then there's no point having the training...you could be the best trade person in the unemployment line.'

(Unit Controller, aged 51)

The need to develop a planned and well-managed transition strategy for the region and its workforce was frequently expressed.

'It would be great if the government could turn around and say, look, we're going to be shutting down Energy Brix or we're going to shut Hazelwood and this is what we're going to put in its place. We're going to put this big gas fired power station in and we'll just move you from there to here. We'll train you up and so you'll continue to--you'll be working there.'

(Unit Controller, aged 46)

The unions and employees are particularly concerned to ensure a “just transition” – one where key stakeholders are all engaged to manage the change; that is workers, government at all levels, the community and business.

This “just transition” is seen as critical in achieving a positive outcome for all parties and will require the development of a regional plan to facilitate the change required. This will mean that a range of stakeholders should be involved in the development of industry sector specific plans and that the recommendations made by Climate Works in its Low Carbon Growth Plan for Gippsland October 2011 may be more effectively taken up. These recommendations most importantly demonstrate significant savings in energy efficiency measures and retrofitting in manufacturing as well as the opportunity for agriculture in the Carbon Farming Initiative.

5.6 Summary and Key Findings

There are important and complex issues raised by those who are confronting an uncertain future. In the following chapter, we consider international experiences, approaches and successes in confronting these challenges.

Key findings:

1. Power generator workers are anxious and feel vulnerable.
2. Among contract managers and workers there is an anxiety about the future, although a number of contractors have taken steps to protect their business, via diversification.
3. There is considerable apprehension among all workers about the possibility of being ‘forced’ into FIFO arrangements, and a very strong awareness of the social consequences.
4. Workers are aware of the problems of out of date or minimal qualifications.
5. For many power station and mine operators redeployment options outside the industry are extremely limited due to the nature of their skills and the lack of formal qualifications.
6. There is a strong attachment to the area, and compelling social reasons for maintaining this attachment.
7. While there is little evidence of an awareness of the possibility of a ‘green’ transition, among unions, workers and some contract management there is a strong view that the transition should be planned, managed and ‘just’ in its focus and outcome.

Recommendation 10

a) That the options for a job transfer scheme for workers displaced following the closure of a power generator and any associated contract companies should be considered as part of the contract for closure and structural adjustment package, with skills at its core.

b) Consideration should be given to outlining and publicising the components and details of a planned, managed and ‘just’ transition, with skills at its core. To address this proposal, governments should examine options for the development of a ‘Workers' Transitional Centre’.

c) That any transition program should be designed with the whole region as the reference, including the development of regional plan that addresses all sectors; this task should be overseen by the Latrobe Valley Transition Committee.
6. International cases: Studies on ‘green’ and sustainable transition

The specific focus of the Latrobe Valley project is on the transition from a high to low carbon economy and, in particular, the transition of an economic region largely reliant on the mining of brown coal (lignite) and power generation and distribution to a ‘greener’ and more sustainable form of economic activity (and employment). This review is primarily concerned with transitions in regions that were once heavily dependent on high carbon industries, such as coal. Promoting a low carbon economy in such areas presents particular challenges. Dependence on coal for employment and the industrial decline that has followed in some places is heavily associated with particular forms of disadvantage. However, it should be recognised that the communities that spring from such forms of employment and work are of particular character, and this has implications for the management of change. A consideration of coal communities and their economic transformation and transition necessitates understandings of the particularities of place and the networks and identities that constitute such localities (Strangleman, 2001).

Coal communities are often considered to be bounded, isolated and mono-industrial in character. The homogeneity and insularity with which such places are imagined is however, often out of step with the reality of life in these places. As Strangleman (2001: 253) argues, it is often that there is complexity within and between such communities. Indeed, the specificity of the Latrobe Valley example – and the complexity therein – is that the mining of coal and power generation and distribution are located in the same locality and functions side-by-side. Nonetheless, these communities are imbued with notions of occupation, place and kinship – they are occupational communities knitted into a locality, which have developed over time across generations of family and reflect particular classed experiences and sensibilities.

It is the haemorrhaging of employment within such communities that exposes the tensions and sometimes unexpectedly fragile social relations that might exist in such localities, and which demands a ‘more nuanced account of the interrelationships between place, class, age and generation’ (Strangleman, 2001: 254) and, the authors of this review would suggest, gender. What is also called into question when such forms of employment collapse are notions of skill, whereby the skills that define miners and their communities become almost of no value (Strangleman, 2001: 265) – and where qualifications tend to be skewed towards the lower end of the skills spectrum. The latter reflects more generally, poor dispositions towards (formal) education and training (opportunities) in these places (Rees and Stroud, 2004).

It is moreover, the pace of transition, as well as its nature, that has a large bearing on such a community’s ability to recover from industrial restructuring (and facilitate successful transition). The speed with which jobs are lost and the wider socio-economic and physical impacts of closure might combine for a difficult mix of joblessness, physical isolation, poor infrastructure and health problems (see, for example, Coalfield Regeneration Trust, UK). To move beyond this focus, it is also necessary to consider the regeneration strategies in place and the whether the right sort of jobs are being attracted to such areas to provide for sustainability and sustainable recovery (Beynon et al., 1999a and 1999b).

The Latrobe Valley is characterised by the community dynamics outlined above. More particularly, these same communities are undergoing similar processes. It is however, significant that the greening of the local/regional economy is identified as an answer to social dislocation and an at risk economy. The focus of what follows is examples of shifts toward the ‘greening’ of regional economies. First, we explore evidence of ‘green’ transitions more generally in order to understand some of the conditions that make the shift to a low carbon economy a reality. We then focus on three cases where strategies have been put in place for the transition of coal communities specifically to low carbon economies.
6.1 Defining ‘Green’ and Sustainability

The Australian Green Skills Agreement (GSA) is predicated on a view that a shift to a cleaner, low carbon world economy has become necessary to i) mitigate the effects of climate change, and ii) respond to the global financial crisis by developing opportunities (Martinez-Fernandez et al., 2010: 6). A key question is what are the implications for work and employment and for labour markets, of measures aimed at reducing carbon emissions and making the transition from a high to low carbon economy? The OECD (2010) suggests that the creation of good jobs in a low carbon economy requires strengthening education and training systems, and supporting activities for the development of ‘green’ skills and indeed skills more generally.

The debate about transitions from a high to low carbon economy has become complex and at times confusing. One central problem is to define ‘green’ skills and jobs, and more generally green strategies, green economy and green stimulus (see Martinez-Fernandez et al., 2010: 6). In addressing these themes, the European Union’s (EU) most recent strategy documents identify seven flagship initiatives under the broader goals of Smart Growth, Sustainable Growth and Inclusive Growth (Europe 2020) (European Commission (EC) 2010).

The implication is that the EU region will:

Reduction greenhouse gas emissions 20 per cent (or even 30 per cent, if the conditions are right) lower than 1990
Produce 20 per cent of energy from renewables
Ensure a 20 per cent increase in energy efficiency

These measures are part of a process that seeks to ensure a sustainable shift towards a low carbon economy.

For some, these steps involve a shift towards a ‘green’ economy, which might be defined in the following way:

*The green economy encompasses economic activity related to reducing the use of fossil fuels, decreasing pollution and greenhouse gas emissions, increasing the efficiency of energy usage, recycling materials, and developing and adopting renewable sources of energy*

(Dierdorff et al., 2009: 3).

As part of a wider programme of growth, the development of a ‘green’ economy has implications for the shape of employment and skills. Sustainable growth through the development of a ‘green’ economy must then work in parallel with inclusive growth. Indeed, the EU 2020 (European Commission, 2010: 32) strategy for Inclusive Growth seeks ‘to modernise labour markets and empower people by developing their skills throughout their life with a view to increasing labour participation and providing a better match between labour supply and demand, including through labour mobility’.

The intersection between the transition to a low carbon economy the strategy for growth demands a comprehensive and strategic approach by policy makers across a range of fields (e.g. environment, energy, industry, Research and Development, transport, education and employment) (European Commission, 2010). The aim is to alleviate and adapt to environmental challenges by working towards meeting skill needs for more sustainable economies with respect to new and changing occupational profiles; the ‘greening’ of some occupations, the enhancement of others,
and the identification of skills and occupations that may be becoming obsolete (Dierdorff et al., 2009).

The objective here is to identify challenges and priorities for the skills necessary for such a transition. By such skills we might refer to knowledge, abilities, values and attitudes needed to live in, develop and support a society which reduces the impact of human activity on the environment (Dierdorff et al., 2009: 3-4). This overarching definition might comprise the following:

**Generic skills**, to adapt current job practices, improve resource efficiency, raise awareness of eco-activities and transition, sustainable citizenship and;

**Technical skills**, to implement standards, processes to protect ecosystems and biodiversity, reduce energy, materials and water consumption; highly-specialised skills to develop and implement sustainable technologies (e.g. adaptation of existing energies, renewable energies, sewage treatment and recycling) (cf., Dierdorff et al., 2009: 4-5).

More broadly, the enhancement and change in necessary skills relates to the changes that are likely to take place in occupations or sectors of employment. Recasting occupations refers to the extent to which the transition to low carbon economic activities and technologies increases the demand for existing occupations, shapes the work and worker requirements needed for occupational performance, or generates other work and worker requirements (cf., Dierdorff et al., 2009). The pressure is on education and training systems to respond to demand expressed by employers, and also as indicated by employees, as well as taking into account the factors involved in the transition to sustainable, smart and inclusive growth in selected occupations across a range of sectors. However, it is not always clear that employers (and employees) know what is required in this respect. Further, employers’ competing (economic) priorities and short-term economic imperatives, coupled with an often ambivalent attitude towards workforce development, raises questions about their ability to shape this agenda (see, for example, Keep and Rainbird, 2000).

Other definitions, for example, Martinez-Fernandez and colleagues (2010: 18-27) identify the dynamics of growth in green skills and green jobs in terms of the ‘stairway to the green utopia’. The focus here is on what is necessary in creating green jobs and greening jobs to work towards a fully developed green economy. These authors identify a range of definitions, from the United Nations Environment Programme (UNEP), Apollo Alliance and elsewhere. According to these definitions, green jobs span a wide array of skills, educational backgrounds, occupational models, and can be found at any point on the supply chain of what are considered green firms or businesses. As a result, green jobs “come in a variety of shades as some are more far-reaching and transformational than others” when it comes to the environmental benefit, they provide (UNEP, 2008, p. 4). For example, the manager of a building retrofitting company can be considered to have a green job, but how about someone working in the administration or accounting of the same company? Can an employee of one of the suppliers of the retrofitting company also be considered to have a green job? (Martinez-Fernandez et al., 2010: 21).

The fuzziness of the ‘green’ term(s) is problematic:

> [An]…adequate definition [is necessary] that corresponds to local economic and employment policy objectives, local policy makers must be aware of this and proceed to prioritise each of these criteria according to their own strategies

(Martinez-Fernandez et al., 2010: 22).
Clearly, it is necessary for the Latrobe Valley project to develop an approach to and definition of ‘green’ and sustainable skills and jobs that reflect the specific regional context and situation.

Further still, it is perhaps necessary to look at where green skills, green occupations or jobs and the (potential for a Latrobe Valley) green economy intersects with the development of decent jobs. Here, the focus is on: i) developing decent jobs which demand the stimulation of creative/knowledge work and high skills jobs that contribute to a quality of life, and ii) making bad jobs better, which addresses the polarisation between good jobs and those jobs that are low skilled, low paid, insecure, lack worker representation and so on. More particularly, Fankhauser and colleagues (2008) suggest that such considerations need to be framed within context of short, medium and long-term ambitions. In the short-term, for example, the switch from conventional forms of energy to renewable energies will have uneven impacts as jobs are lost in carbon intensive sectors and created in emerging sectors. As low carbon technologies mature, net jobs gained will diminish and structural unemployment will rise further as gains in the emerging sectors of employment may not be sustained in the long-term.

Martinez-Fernandez and colleagues (2010) suggest that the recovery from the global financial crisis provides an opportunity to identify policies, strategies and measures for green growth and by implication the transition to low carbon economies. Such growth requires stimulus funds, and a percentage of recovery funds have been dedicated to ‘green’ economic stimulus (Robins et al., 2009). This funding allows a consideration of the political and economic context within which transitions to green (or low carbon) economies occur, particularly in relation to green skills development. In addition to the funding devoted to green development (and thus growth), the degree to which state, capital and labour are involved in the decisions surrounding the management of change is also important. In brief, structures and institutions shape one society from the next and this must be taken into account in analysis (see Bosch and Charest, 2008).

These debates are important for understanding the management of transitions from high to low carbon economies. The core focus is on the strategies employed to ensure transition to a low carbon economy and the transition is dependent on a coalition of interests, involving community leadership, industry and union support, and government engagement. In particular, education and training are key elements of the strategy to achieve transition. However, strategies for transition are uneven and complex with different outcomes (and implications) for the development of relevant skills and employment.

6.2 Green Transitions

The areas in which ‘green’ transition policies have been promoted are often areas with higher unemployment rates, higher rates of poverty and correspondingly few skills, poorer health and living conditions. Furthermore, such areas have been disproportionately affected by successive economic recessions. It is clear that for reasons of long-term sustainability these regions would benefit most from effective transition strategies as a way of dealing with the more specific challenges faced by former coal communities.

In this section we explore how countries and regions (not necessarily former coal mining regions) have utilised ‘green’ strategies more generally, as a way of understanding how such an approach might be employed in areas that were previously dependent on coal and energy generation. We provide a summary of strategies adopted in the South West region of the UK, South Korea and Costa Rica.
6.2.1 UK – South West Region

The economy of the South West region of the UK is largely supported by the service sector (78 per cent Gross Value Added - GVA), of which a substantial amount is tourist related services, followed by manufacturing (11.5 per cent GVA) and construction (5.7 per cent GVA) (South West Observatory, 2011). It lags behind Great Britain as a whole in terms of productivity, due to its under representation in highly productive industries and slower economic growth generally. Further, two counties in the region are in receipt of EU Objective One, making it the focus of regeneration strategies and a region that could benefit hugely from a successful transition strategy.

Indeed, the South West region presents an interesting case where the strategies for economic recovery and regeneration initiatives have been framed within a specifically ‘green’ context and focus (ARUP, 2009). Although this fits in with the overall EU and UK ‘green’ recovery agenda (see the Commission of the European Communities, 2008; European Commission, 2010; CEDEFOP, 2010a), there is no evidence of comprehensive transition strategies in place within any of the member states. While there is evidence of transition strategies, they vary in their level of development, the amount of funds invested, their scope, and how they are implemented. Some member states and/or regions place more emphasis on developing a strategy for an economic recovery built around transition to low carbon economies than others. ‘Green’ investments in Germany, for example, account for 19 per cent of its recovery plan, whereas France only dedicates 8 per cent of its recovery plan funds on such investments (Goldenberg, 2009).

The South West region has placed a strong emphasis on developing a transition strategy with numerous regional development policy documents being centred on the issue of ‘green’ development, jobs and skills (see SWRDA website). Indeed, the region is well placed to make this transition due to its designation as an area of outstanding natural beauty, giving the region an incentive to maintain this status and limit environmental damage. The region’s further and higher education institutions are recognised for their expertise in sustainability giving it a competitive advantage, and it is also home to a growing number of environmental SME’s. In recognition of these strengths, the region has endeavoured to develop a transition strategy.

Current progress includes:

- A growing number of people employed in the energy efficiency sector, in 2008 there were 4,300 full time equivalent jobs in the Region, directly contributing £294m of GVA to the economy in the South West (cited in Arup, 2009)

- A growing number of people employed in the renewable energy sector. Estimates suggest that in 2005 there were 1140 full time equivalent jobs in this sector, this rose to 2,900 in 2008; this is equivalent to an average annual growth rate of 37 per cent. The sector directly contributed £215 million of GVA to the regional economy in 2008, compared with £34 million in 2005. Furthermore, the large area of coastline in the South West means that offshore renewable energy presents further opportunity for green development and jobs in the region (Arup, 2009).

- The Wave Hub initiative aims to produce electricity through wave and tidal power (Emb, 2010).

- Developed alongside the Wave Hub is a key research institute in the region, the Peninsula Research Institute in Marine Renewable Energy (PRIMaRE) supported by the Regional Development Agency and led by the Universities of Exeter and Plymouth (Universities South West, 2011a).
• West of Isle of Wight offshore wind project (Emb, 2010).

The UK government also selected the region as the first of its ‘Low Carbon Economic Areas’ (LCEA) focusing on the development of marine energy demonstration, servicing and manufacture, in recognition of its regional expertise in marine research, development and engineering and the potential offered by its huge marine resources (Asset skills, 2009). This is part of a broader UK strategy whereby the UK government identifies regions with either geographical or industrial advantage to develop a competitive low carbon economy. By working with local government and regional development agencies, the UK government aims to stimulate employer demand for low carbon skills, accelerating growth in and developing supply chains (BIS, 2010).

In the case of the South West's marine energy sector development, SME employers and strategic skills partners have made good progress in identifying regional skills demand and addressing specialist skills needs. This is part of the wider strategy of low carbon development in the region being coordinated by the regional development agency process. Technology and skills demonstrators are supported to accelerate skills provision for the marine energy sector. The project will showcase the supply of skills as a catalyst for the wider skills system and to stimulate latent employer demand by engaging with an RDA led industry forum. Other strategies developed by the RDA-led skills strategy group include rolling out the Higher Education Funding Council for England’s (HEFCE) funded Low Carbon Futures Leaders programme, which offers graduates paid work experience in the sector, and a project to address urgent higher level skills needs. Targets have been set for the number of jobs created, individuals qualified, the level of business assistance, additional funding, and for the necessary business assistance. The strategy of the South West LCEA is now being used to inform wider Skills Sector Council (SSC) led work on a Renewable Energy Skills Strategy and is also being used as a model to inform collective action in other low carbon sectors such as Housing Energy Management (BIS, 2010).

Successes for the marine energy sector so far include putting in place mechanisms for effective engagement with employers, aligning regional funding streams, and drawing on the potential of all the skills partners involved (including Sector Skills Councils, Skills Funding Agency, Association of Colleges, Foundation Degree Forward, National Apprenticeship Service, Universities South West, and Job Centre Plus). As a result of this skills partnership, a marine energy skills plan was formed as part of a wider £2.4 million Low Carbon High Skills project co-ordinated by Universities South West, the project ran for fifteen months and ended in July 2011 (Universities South West, 2011b). Although the overall outcome is not yet known, a number of developments occurred under the marine skills plan including product development to meet business needs, the delivery of bespoke training solutions, and the provision of 250 part-funded graduate internships to low carbon businesses in marine energy (BIS, 2010).

Further developments include a South West Regional and Employment Skills Board (SWRESB) commissioned piece of research which looked at ‘green’ skills developments in the region:

• Apprenticeships in green building skills being offered as part of the eco towns’ initiative. Cornwall Council is currently working in partnership with local providers to create a centre of excellence for sustainable construction in the South West (BIS, 2010)

• The launching of a wind energy sector specific training programme through the Renewable Energy Apprenticeships Programme (REAP). This a new ‘UK wide
apprenticeship framework and vocational qualification for operations and maintenance technicians has been developed off the back of a Skills Accord signed off by industry and key partners in 2009. The project has been coordinated by RenewableUK and EU Skills with some support from the National Skills Academy for Power, (NSA-P), (Emb, 2010:21).

- A new Offshore Marine Academy run by Offshore Marine Management that aims to provide foundation level training in the offshore sector
- Short Courses such as Garrad Hassan (e.g. Wind Farm Design, Wind Farm Safety, Offshore Wind Energy) and RenewableUK Accredited Courses in Health & Safety (e.g. Marine Survival Training, Working and Rescue from Height)
- Training offered in-house by manufacturers
- Programs that support such developments include:
  - STEM South West (STEM champion for the region based at Petroc)
  - The South West Low Carbon High Skills Project and Leadership and Management
  - Development initiatives (Emb, 2010) The HERDA-SW Marine Sector Plan which is part of the SWRDA funded Knowledge Exploitation South West 2 (KESW2) project. It aims to support and encourage greater HE interaction with business in the region
  - The KESW2 will also work to develop Higher Education plans in the region for emerging green sectors, with a focus on the marine energy sector as a key area for growth. Higher Education is seen as being key in engaging with and forming links with the business sector, but will also play a vital role in the provision of skills, training, innovation research and development

Such developments show promise but are in their early stages. The development of offshore wind and marine energy sectors offer the most development potential in the region, with regional strengths in both research and development and centres of international expertise in these energy sectors (Emb, 2010). However, skills remain an issue if the region is to fully take advantage of green development opportunities. In line with the rest of the UK (see UK Commission for Employment and Skills, 2010), the South West Observatory identified skills gaps in Science Technology Engineering and Mathematics (STEM) and leadership and management skills (South West Observatory, 2010 cited in Emb 2010). However, aside from the development of STEM, in which a long term higher education strategy needs to be devised (Emb, 2010), much skills development will entail merely an up skilling of existing skills rather than the development of new ones (Bird and Lawton, 2009; BIS, 2010; CEDEFOP, 2010).

**6.2.2 UK – South West Region – Assessment**

In the UK, regional development agencies are responsible for promoting economic development and regeneration, business innovation and efficiency, promoting employment and the enhancement of skills. They are therefore responsible for developing and carrying out initiatives within the overarching legal and constitutional framework of UK government policy, which is developed by the Department for Business Innovation and Skills (BIS). In recent years there has been a strong emphasis on ‘green’ skills development in the UK (see National Skills Strategy in BIS 2009; Energy White Paper 2007).
Thus, transition is very much a state led policy development with skills needs and training provision being identified and funded by the state, with little input from businesses and industries, implemented at the local level through regional development agencies. In 2012, this is set to change with Regional Development Agencies replaced with Local Enterprise Partnerships. This will entail local businesses and local authorities working in partnership, in order to give regions more control over their local economy (BIS, 2011). The implications this may have in terms of transition strategies in the South West region is highlighted by the key role that local government has played in implementing national government policy.

Moreover, issues around training provision also need to be addressed with evidence of unevenness in available information on the training and the quality of its provision. Much of current on-the-job training remains informal and unrecognised and is therefore not funded (see, for example, Ashton, 2004). A more proactive policy is needed to fully take advantage of green employment opportunities (BIS, 2010). Closer collaboration between industry and training advisors could help address this problem. Although there are some successful partnerships already underway such as the partnership between Babcock and Petroc’s with their development of a Skills Centre within the Babcock’s Appledore base, which delivers a Marine Engineering Apprenticeship and other Skills for Life provision on site. Both organisations have intimated a desire to expand on provision on site and have also expressed an interest in the REAP (Emb, 2010).

The South West would also benefit from utilising skills competencies in other sectors in order to support the development of marine and off shore energy. In terms of providing these skills the Emb report recommends flexible funding solutions that do not just focus on new entrants into the sector but on top up units of learning in order to up-skill the existing workforce, some of the evidence above represents strategies to address these skills issues, such as the REAP.

Much of the development in the region so far has been co-ordinated by the South West RDA. The central government recently legislated to abolish all RDA’s by 2012, replacing them with Local Enterprise Partnerships (LEPs). Obviously, the impact this change may have on skills development in the region is not yet known, but it is hoped that the formation of LEP’s will entail better partnerships between industry and training providers. The success of such a strategy will perhaps depend on the level of public funding available and whether the newly formed body takes account of the potential for market failure (Emb, 2010).

Finally, it is apparent that success depends on partnerships that involve both further and higher education bodies. In the case of further education, the most effective training programs would seem to be those that are focused on the provision of skills necessary for the types of jobs that are emerging within the transition to a low carbon economy. These may be an adaptation of existing skills or the promotion of new ones. Complementing this feature, it is also apparent that higher education has an important role to play in developing and refining technologies and processes associated with transition. At times, this will involve innovative and path-breaking research; at other times it will include an assessment of the socio-economic impacts of change and adaptation. Such partnerships provide the means for transition.
6.2.3 South Korea

South Korea’s ‘green’ stimulus package is estimated to be 81 per cent of its overall package, making it arguably the world's most comprehensive stimulus package in relation to the transition to a low carbon economy. It has committed to achieve 5 per cent of energy from renewables by 2011 (Lee et al., 2010; Strietska-Ilina et al., 2011). This drive to develop a low carbon economy has been attributed to the current economic crisis and the need to develop greater energy security and improve the quality of living in the country. The country currently imports 96.7 per cent of its energy from overseas (Choi, 2011), and has the fastest growing emission rates amongst OECD countries due to its reliance on high energy consuming sectors such manufacturing and transport to generate its wealth (Lee et al., 2010).

Developing a secure energy supply of its own not only prevents the Korean economy suffering from rising fuel prices and supply shocks but will also stimulate new economic growth, whilst improving the quality of life for its inhabitants. ‘Green’ growth is therefore seen as central for the future sustainable economic success of the country (Choi, 2011). It launched a Green New Job Creation Plan, in January 2009, aiming to create 1.18 million jobs by 2020 through the growth of ‘green’ and low carbon technologies (UNEP, 2009) and to become the 7th ‘green’ nation by 2050 on the ‘green’ competitiveness index (Lee et al., 2010).

The plan has nine core projects organised in the following four themes:
- Conservation: green cars, clean energy and recycling
- Quality of life: green neighbourhoods and housing
- Environmental protection: revitalising four major rivers and securing water resources
- Preparing for the future: IT infrastructure and green transport networks

The Korean Government has driven this strategy, investing large amounts of money into training at a university level, with less of a focus on VET training. Only 10 per cent of unemployed VET recipients have trained in the skills directly associated with low carbon or ‘green’ industries.

The country will invest KRW 5 trillion over the next five years with the aim to become a global leader in ‘green’ and renewable technologies. One important development that has contributed to this trajectory occurred in 2002, with the establishment of the Korea Environmental Education Centre (KEEC). This Centre has links to the Republic of Korea’s Federation for Environment Movement, the oldest and largest NGO environment movement in the Republic of Korea. KEEC focuses on youth and fosters competencies such as environmental awareness and attitudes, and the related knowledge and skills. It also provides instructors and training programs in environmental protection for the public (for example, eco-guide and environmental instructor training classes), to support KEEC’s goal of ‘Environment education for all’.

Future skills needs have been identified by the various Sector Council Human Resource Development (SCHR D) bodies, of which there are now 23, including the newly established renewable energy and green finance SCHR Ds. The latter two specifically green SCHR Ds will begin to administer skills surveys to their member enterprises to assess skills changes, skill needs and resource gaps in the respective industries. In education, currently the curricula are being restructured to respond to the demand for future skills and adapted
accordingly to respond to the adaptations and changes in current occupations. Indeed, developments so far have led to skill supply exceeding demand, with many graduates in the environmental sector, and most jobs in this sector being low-skilled and low-paid. The government is now working towards restructuring the environmental sector to ensure there is a demand for the new highly skilled worker (Strietska-Iлина et al., 2011). In the next five years the growth rate of such jobs is expected to be 6 per cent, compared to the average total job growth rate of 1.3 (Presidential Committee on Green Growth, 2009 cited in Strietska-Iлина et al., 2011).

The Vocational Education and Training Reform Centre was established in 2009 to up-skill individuals and green existing industries’ training policies. It provides vocational education and training based on skills identified by the SCHRD. As a result of the support of this programme, the automobile SCHRD, for example, is providing skills training in the development of eco-friendly automobiles. Several government support strategies are being devised to enhance the skills and competencies of workers in the sectors and areas that are in the process of transition. The Government will fund training costs and provide income subsidies to businesses that provide their workers with training opportunities, which prepare them for these skill demands.

Further developments include training strategies devised in collaboration with the renewable energy SCHRD and Green Finance SCHRD. The renewable energy SCHRD aims to provide currently employed workers with a vocational training programme for new and renewable energy related skills. Short-term training courses (1–2 days) have been devised to cover solar energy design, solar energy and earth heat pump implementation as well as renewable energy CDM. The Green Finance SCHRD provides advice on ‘green’ and socially responsible investments, risk analysis, green industry trends and green financing (Strietska-Iлина et al., 2011).

Current Government funded initiatives include:

A) The Sustainable Building Technology Education Programme at Korea Institute of Construction Technology Education
   • A government funded education programme, which aims to foster expertise and sustainable development in eco construction.
   • A full time intensive course, which takes four weeks to complete.
   • Students participated due to their belief that the demand for eco-friendly construction was on the increase.
   • Those who participated claimed to benefit from the practical knowledge and skills learnt on the programme, feeling it responded to the changes in new technologies and skills.
   • Three sessions were implemented in 2009 in which 50 students enrolled in each.
   • Despite the perceived benefits, students reported that there were limited employment opportunities to make use of their new skills, mirroring the abovementioned concern that government needs to do more to stimulate demand, through changing building regulations for example, in order to create employment opportunities for those with green skills. (Strietska-Iлина et al., 2011)

B) Education and Training Centre for Energy Technology, Seoul National University of Technology.
• A government funded national centre established to develop higher level researchers and engineers through graduate school programs.
• Also provides vocational training for employees in the energy field and gives support for on-the-job training.
• Courses include renewable energy engineering, energy system engineering (intelligence-building facility), energy safety (gas explosion prevention and management) and energy policy (global trading and technology agreements) (Strietska-Illina et al., 2011).
• Between 2007-2009, 9,390 people received education and training through this Education Centre programme with a budget spend of 6,500 million KRW (cited in Strietska-Illina et al., 2011).

It is difficult to assess how successful Korea’s ‘Green Jobs’ strategy will be as it is still in its early stages of development, although evaluations suggest that such job growth will outstrip the growth of other jobs. Numerous strategies have been devised to promote ‘green’ skills, although there is yet to be a comprehensive research into identifying current and future skills needs; the work of the green SCHRD is set to change this absence (Strietska-Illina et al., 2011). If Korea is successful in making a transition to a low carbon economy, it will represent a huge paradigm shift, only made possible by conscious government effort rather than a natural evolutionary process, and thus highlighting the top down nature of the strategy (Choi, 2011).

6.2.4 Costa Rica

Protection of the environment has been high on the Costa Rican government agenda for decades, due to its social reliance on its resources. Agricultural and industrial exports and eco-tourism generate much of the country’s wealth - commerce, tourism and services account for 71 per cent of GDP, industry 22 per cent of GDP and agriculture 6.5 per cent of GDP, with exports being valued at $9.375 billion in 2010 (US Department of State, 2011). There is therefore a strong impetus to preserve its natural resources. The country’s history of conservation perhaps makes it well placed to make a transition to a low carbon economy, with an emphasis on the environment. After all, Costa Rica is responsible for protecting five per cent of the world’s biodiversity (St Clair, 2011). The first national park was designated in 1945, with conservation policy high on the agenda ever since (Strietska-Illina et al., 2011). Indeed the country is currently rated 3rd in the world in the Environmental Performance Index and 95 per cent of its energy comes from renewable sources due to its development of hydro technologies such as hydroelectric power, pioneered in the 1950s (St Clair, 2011 and Strieska-Illina et al., 2011). However, despite its green history, the country faces challenges in reducing CO2 emissions from transport (due to its dependence on private transport) and industry. In the industrial sector CO2 emissions have increased by 75 percent between 1997 and 2006 (cited in Strietska-Illina et al., 2011).

The focus of Costa Rican policy has been to establish a carbon neutral economy by 2021. In view of this commitment the 2009 Protection Plan, devised in response to the global recession, focused on economic stimulus and social protection. While there was no specific mention of the ingredients of such a transition, this was perhaps due to its history of environmental protection and a long-standing low reliance on fossil fuels, thus such transition initiatives have a long history and are more embedded in the culture of the country. However, there is still much work to be done if it wants to reach its goal of
becoming carbon neutral by 2021, with the challenge being to ensure the right skills are in place to make this goal a reality.

Recent strategies focus on developing sustainable practices and energy production, and include:

A) The Peace with Nature Initiative. This initiative aims to confront degradation and help the coordination, implementation and follow-through of intervention processes in environmental and sustainable development issues, including:
- Measures to make Costa Rica a carbon neutral country by 2021
- The development and execution of Environmental Management Plans in all government bodies
- Increased forestry cover and the protected areas system
- The inclusion of Environmental Education for Sustainable Development in the public education curriculum.
- The development of the 'C-Neutral' seal to differentiates goods and services through a certification system, strengthen competitiveness and show a commitment to the environment.

B) The National Strategy for De-Carbonization of the Economy
A government strategy to promote reduced dependence on fossil fuels
- Includes the promotion of use of electric transport, energy efficiency policy for industry and general consumption.
- The development of bio fuels through collaboration between government, entrepreneurs and research centres to develop biomass materials, including algae and pineapple waste, derived from wastage from agro-industrial processes.

Environmental awareness is one key to the country’s education strategy. By law, environmental education is incorporated into all levels of schooling in Costa Rica. Education is also incorporated into its Regional Climate Change Strategy and generally aims to raise public environmental awareness and encourage more sustainable practices. A Strategic Framework for Environmental Education was developed in 2004 by the Public Education Ministry for Costa Rica’s first and second basic education. It focused on:

Institutional Environmental Management: involving decision-makers and those implementing decisions made in the design of institutional management practices.
Teacher Education: development of training and continuous education for teaching staff delivered by experts from major universities.
Environmental Education Projects: Using key players in civil society organisations to develop environmental education projects and strengthen the value of the environment within individuals.
Sustainable Development Culture: promoting environmental action through education.

A number of technical and professional educational programs are offered in the public and private universities including impact evaluation, protected area management, environmental management, sustainable local development, water, coast and basin management, waste management, tourism and legislation.

In terms of a strategy to develop the appropriate skills necessary to make a transition, the National Training Institute has begun to identify the needs of the economic sectors. This process includes the design and delivery of training programs, offering technical
assistance about the training to institutions and companies and establishing teaching enterprises. In terms of skills development the changes have been modest, with many of the skills required already part of the conventional training program. New skills acquisition has been developed merely when necessary. Emerging skills include energy efficiency measures, the ability to measure carbon footprints, natural resource management and fluency in foreign languages.

In response to these emerging skills needs, education and training programs are being developed by various actors but usually in an *ad hoc* fashion due to the lack of information on future skills needs. This shift includes the development of educational programs mentioned above. What is notable with these specific environmental educational programs, such as natural resource management, is that they also incorporate core skills training such as organisation and planning skills, leadership skills, legal aspects of sustainable development, statistical analysis, and project development and evaluation, to name but a few. Incorporating these core skills into educational programs ensures students have a broad set of skills, enabling them to participate in the emergent economy.

Companies and business associations are also developing their own training, with opportunities for continual VET, on-the-job training programs and external training programs supported by companies and ministries to meet skills needs. VET programs keep the vocational skills of those already employed but extend and offering different certification programs to prepare people in the public and private sectors to meet environmental management and sustainable development standards. However, there are currently no links between universities and the public and private sectors in terms of assessing and developing the necessary skills to become carbon neutral. It is therefore impossible to make an effective evaluation of whether or not the current strategy of incorporating environmental awareness and issues into all aspects of the education system actually provides the skills necessary to make the shift to a carbon neutral economy.

Thus, overall, there are definite efforts being made in Costa Rica to interweave environmental awareness and protection into much of government strategy and policy development. Yet there is no integrated strategy in place to develop the skills necessary to make the shift to the emerging carbon neutral economy. To utilise fully carbon neutral growth opportunities, the government would need to do more to create a skills and job creation strategy and policy implementation program (Strietska-Iлина *et al*., 2011).

### 6.2.5 Lessons

These three cases illustrate a range of features in the transition to a low carbon economy:

First, the RDA’s in the South West region of the UK have been central in implementing state driven strategies successfully. However, training is not targeted to the needs of businesses, which means that more needs to be done. The shift towards LEPs may address this through skills development but this shift cannot be left entirely to the private sector because short-term business interests rather than long-term societal concerns will then drive the focus. Partnerships between higher educational bodies and public private partnerships appear to be critical to the successful implementation of policies to prepare for the transition to a low carbon economy.
Second, South Korea has promoted a state driven top-down approach to developing strategies for skills and development. However, little has been done to stimulate demand and the shift to a low carbon economy, potentially resulting in a highly skilled workforce without appropriate jobs. Furthermore no comprehensive assessment of skills needs has been undertaken.

Third, in Costa Rica, whilst carbon neutral strategies have been promoted by private initiatives these have been supported and developed within a strict state regulatory framework. Of note, there has been high participation of NGO’s in developing conservation strategies. This activity has been furthered and complemented by state education to provide and promote the necessary skills for carbon neutral development. Legislation has been introduced to ensure that there are relevant components in the curricula, although, as yet, there is no comprehensive assessment of skills needs. Thus, the country lacks institutional capacity and has an insufficient skills base to achieve the comprehensive shift to a carbon neutral economy.

The next part of the review presents three detailed reports on attempts to transition to a low carbon economy. Each case demonstrates how regions based on traditional industries, with coal and energy at their centre, have taken steps to address this transition. In the first case, the Appalachian region of the United States is reviewed, followed by a consideration of the Ruhr region in Germany and the final case examines Wales, in the United Kingdom.

6.3 Appalachia

The USA’s manufacturing industry has faced increasing competition from Chinese imports over recent decades (Herzenberg et al., 2005a). The coal industry has also been undergoing a similar decline, becoming less economically viable from declining mine reserves and increasing legislative pressures in relation to environmental regulation (McIlmoil and Hansen, 2010). This shift is particularly troubling for regions that are highly dependent on manufacturing and coal mining, such as Appalachia. The region has a population of over 25 million and spans 13 States. Historically, coal has played a major role in the Appalachian region, with it once providing two thirds of the nation’s coal and being the main provider of employment in the region. However, with technological change, economic restructuring, particularly in manufacturing, and outsourcing the region can no longer rely on these industries as the main sources of employment (ARC, 2010).

Since 2001, the region has experienced significant economic distress. Relevant factors include the high dependence on low-wage manufacturing in Southern Appalachia, the long-standing underdevelopment issues in the coal dependent regions of Central Appalachia and incomplete adjustments from previous manufacturing jobs losses in Northern Appalachia (Henzenberg et al., 2005b). Indeed coal is becoming more and more costly to dig, meaning that those areas that are still heavily dependent on coal mining for employment, such as southern West Virginia, Virginia and Tennessee are likely to face a steep decline in the coming years, with repercussions in terms of job loss and household insecurity (Lovan, 2011). The already economically disadvantaged position of the region and predictions of further decline means that the region is vulnerable with an uncertain future. Thus, attempts to diversify the region are crucial for its future development (McIlmoil and Hansen, 2010). The following will illustrate current attempts at diversification by exploring the impact of and reaction to previous job displacement in the region.
6.3.1 Worker Displacement

A 2005 report carried out by the Appalachian Regional Commission (ARC), a state-federal partnership promoting the sustainable development of the region, compared the impact of displacement on the Appalachian region with the rest of the US through the examination of five different waves of the Displaced Worker Survey conducted every two years by the Census Bureau and Bureau of Labour Statistics (BLS) (Herzenberg et al., 2005a). The survey found that overall displaced workers in the Appalachian region were less likely to find alternative jobs when compared with other displaced US workers. A lower proportion of Appalachian workers managed to find re-employment, and if they were employed, these workers were more likely to earn less than they did in their previous job. This profile has been attributed to the higher share of older, less educated and long-tenured workers displaced in the region. In addition, a higher proportion of the displacement was due to plant closure, presenting serious challenges for the economic sustainability of the region.

During the period of 1999-2003, the data showed that displacement rates were higher for workers over the age of fifty-five. In terms of gaining new employment:

- 24 per cent of displaced Appalachian workers had not worked at all since losing their jobs compared to 20 per cent of their displaced contemporaries in the rest of the U.S.
- 74 per cent of non-Appalachian workers displaced from full-time jobs were re-employed, compared with 69 per cent of their counterparts in Appalachia.
- Of the displaced full-time workers that did manage to find new employment in Appalachia, 22 per cent earned the same or more in a full-time work compared with 26 per cent of workers outside Appalachia.
- Less educated Appalachian workers were more likely to suffer displacement than their more highly educated contemporaries. The displacement rate for workers in Appalachia with less than a high school diploma was 2.9 per cent compared to 1.9 per cent for workers with at least a college degree.
- When compared with displaced workers outside the region, Appalachian workers with low levels of formal education were still more likely to be displaced than their non-Appalachian contemporaries with the same level of education.

The data also showed that over more recent years, re-employment has become more difficult for displaced Appalachian workers.

In January 2004, for example, 58 per cent of Appalachian workers displaced during 2001-2003 had a job whereas in February 1998, 70 per cent of Appalachian workers displaced during 1995-1997 had secured a job. The 58 per cent re-employment rate of displaced Appalachian workers in January 2004 was lower than the non-Appalachian US rate of 65 per cent in the same month. Of full-time workers in Appalachia who were displaced during 1999-2003 only 16-17 per cent were working as full-time employees again and earning the same or more money (taking inflation into account) at the time of the next survey. Between 38 and 40 per cent were unemployed or not in the labour force, while 6 to 8 per cent were working part-time, and 36 to 40 per cent were in a full-time job earning less money (taking inflation into account) (Herzenberg et al., 2005a).

One feature of these relatively low rates of re-employment was the difficulty of finding alternative employment. This difficulty has been attributed to the over-dependence on the declining coal and low-wage manufacturing industries as a means of providing
employment (manufacturing accounts for 17 per cent of all jobs in the region as opposed to 11 per cent in the U.S as whole), the region’s high poverty rate and the workforce having a relatively low educational level. The region was underdeveloped and ill equipped to diversify its economy and deal with the transition away from these industries. This vulnerability and inability to secure alternative employment was further compounded by the economic recession (Herzenberg et al., 2005a). Such trends are set to continue, with pressure now on carbon intensive industries from environmental legislation (McIlloil and Hansen, 2010). There is increasing competition from Chinese and Mexican markets, which make it difficult to put in place strategies to revive and regenerate the region (Herzenberg et al., 2005b).

The following examines the responses to worker displacement and sets out the initiatives that have been in put in place to diversify the regional economy.

6.3.2 Responses to worker displacement

A report by the Keystone Research Centre (an independent research and policy development institute), commissioned by the ARC, attempts to assess the effectiveness of the displacement and adjustment policies present in the Appalachian labour market in order to outline some form of best practice that could be applied to the region as a whole to ensure long term economic sustainability (Herzenberg et al., 2005b). This report focuses on case studies from seven Appalachian states (New York, Pennsylvania, Ohio, West Virginia, Kentucky, North Carolina, and Georgia).

The report identifies three different types of response to lessen the blow of displacement:

- **Reactive**: Policies focusing on dealing with the direct impact of displacement, but with little attempt to focus on comprehensive long term development strategies (the principle response in the region).
- **Dispersed**: Effective practices that went beyond simply dealing with the initial impact of displacement, but were not co-ordinated enough to amount to an overall strategic response.
- **Comprehensive**: a shared vision and strategy that was implemented by and across multiple workforce and economic development agencies.

Most cases showed evidence of more reactive and dispersed policies and practices in terms of response to initial displacement. Laid-off workers, for example, were offered assistance in finding new employment through one-stop career centres, but often these were only put in place following displacement rather than as part of an early warning system. If in place such a system would involve a multi-stakeholder approach. The purpose was to inform workforce development and adjustment services following layoffs, allowing communities and workers to make a smooth transition into new employment. However, evidence of potential early warning systems were only apparent at an informal level, yet were shown to be vital in allowing workforce developers to plan for a rapid response to the layoffs when they happened (Henzenberg et al., 2005b).

One such example, which is now being replicated at other sites, was the Steel Valley Authority’s Strategic Early Warning Network (SEWN) in south western Pennsylvania. Representatives from business, labour organisations and community leaders came together to identify at-risk manufacturing firms and then provide assistance with the
restructuring process, preventing lay-offs where possible and helping those identified for displacement before it actually occurred.

The most common response in these cases was a reactive rapid response. The most successful of such initiatives were those where multi-stakeholders were consulted. These consultations informed workforce development with the companies in question providing resources, together with state and federal programs. To illustrate what was involved, an examination of one of the more successful programs is presented. Based in West Virginia, it entailed the Workforce Investment Board (WIB) using information from the reports it commissioned to inform workforce policies. Multi-stakeholders, including business representatives, community colleges, public schools, four year public and private colleges, training vendors, labour unions and other workforce development stakeholders, were consulted. They informed the report that was then used to form policies that would ensure that displaced workers not only accessed new employment possibilities but also that the employment accessed provided a self-sufficient wage. Crucial to achieving these outcomes, the information was used to shape and inform the training provision to ensure that it mirrored labour market demand and income goals (Henzenberg et al., 2005b).

6.4 Other Cases

A range of initiatives have been introduced in sub-areas of the Appalachian region:

6.4.1 North Central – Pennsylvania

North Central region of Pennsylvania also used a similar initiative, tailoring training to the local economy:

Strong connections with employers helped identify priority training options. This was done through employing cluster analysis to map industry sectors with growth potential using industry statistics and expert knowledge from the Workforce Investment Board.

The state identified high demand occupations that offered a self-sufficient wage but also identified a skills shortage and then specifically directed training resources to these occupations. This was done by examining government data to assess which occupations were in excess demand (identified through examining growth rates in occupational employment, occupational unemployment rates and ratios of training course completers that qualify them to enter the profession) and those that provided a self-sufficient wage or above.

Local knowledge from industry experts, such as WIBs, training and education providers and those involved with economic development was then used to modify the data generated from the statistical reports so that the data reflected the most recent developments, allowing them to identify high priority occupations. This therefore allowed them to address the skill needs necessary to help develop the local economy and provide decent job opportunities (Henzenberg et al., 2005b).

6.4.2 North Carolina

A series of initiatives have been introduced in North Carolina:

- Development strategy run by Advantage West, the regional economic development organisation
- Required industry in all its economic development regions to identify critical industry clusters and identify strategies to support them.
- Utilised links with the local community college to provide workforce training for employers.
- Advantage West worked with educational institutions to predict future skills demands and required institutions to be pro-active in providing the skills needed for them.

### 6.4.3 West Virginia

West Virginia, a major source of displacement due to the long term decline of coal in the region, introduced the following:

- United Mine Workers union operated One Stop Career Centres for laid off miners.
- Successful in identifying miners’ skills that could be transferred to other occupations that offered the same or above the wages obtained in the previous job.
- Also focused on developing a strategy that would ensure future employees would want to stay in area post-education thorough improving educational attainment and economic opportunities.

Thus, areas that appeared to offer the most potential for economic and workforce development had effective leadership in place and involved a variety of stakeholders to inform a regional strategy that had explicit goals that were then measured in terms of their success. The success of some programs was undermined due the absence of a unified regional strategy, with the various economic and workforce development agencies tending to work separately and to their own agendas. Furthermore, increasing pressure on public funding has resulted in cut backs putting the more innovative programmes at risk (Herzenberg et al., 2005b).

### 6.4.4 An Overview

Overall, although the more successful of above mentioned programmes may have helped displaced workers to access jobs, for the most part, the jobs accessed tended to be less well paid and offered little prospects for the overall future prosperity and sustainable development in the region. As a result, some ex-workers became dependent on pension payments from previous jobs to supplement their poorly paid current jobs (Herzenberg et al., 2005b). Those who could not find work in these areas were forced to either commute for work, rely on spouses that had previously not worked outside the home to find employment or depended on disability insurance. When this is taken alongside the general low levels of education in the region and the trend of outward migration by the more highly educated and skilled of the younger generation, there appears to be little hope for a future thriving sustainable community.

Thus, creating good new employment in the region is crucial in ensuring the future success of the region. The following will look at attempts to regenerate and diversify the region.

### 6.4.5 Evidence of shifts to low carbon economies

Up until recently, attempts to diversify the region’s economic base and create more opportunities has tended to be by offering incentives to investors from outside the region (i.e. tax credits, low interest loans and subsidized training). These initiatives have been largely unsuccessful at stimulating long-term job growth and investment in the area, due to
the lack of infrastructure, having the necessary skills, and isolated locations where people were less willing to live (Herzenberg et al., 2005b; Flaccavento, 2011). Further, where manufacturing industries have been drawn to the area they are now facing decline themselves, with a falloff in manufacturing in the region since the 1990s. Attracting such firms to the area was traditionally viewed as the quickest way to provide new employment opportunities, yet directing economic and workforce development money into such initiatives has been criticised. Often the incentives are not accompanied by sufficient funding to develop local assets in the region or to develop the skills that are necessary to benefit from the investments. A report by the Mountain Association for Community Economic Development, for example, found that 79 per cent of the entire State budget for economic development was spent on capital financial subsidy and industrial recruitment to attract investment from outside the area. This scale of investment left little finance to train and develop the required workforce (see MACED, 2005).

Perhaps in realisation of this outcome, more recent regeneration strategies have attempted to work with an area’s strengths in an attempt to create local and area advantage. Such a strategy attempts to build on the natural, structural and cultural assets that already exist in the area whilst keeping the benefits local. This approach has included improving the infrastructure of the area with new sewerage systems, better broadband access, and the renovation of disused industrial sites and buildings, in order to make the area more suitable for the stimulation of entrepreneurial growth. Strategies have been put in place to develop marketing, leadership and entrepreneurial capacities, with the aim to use these to enhance awareness and development of the assets offered by natural environment, culture, arts and the heritage of the area; the aim is to attract revenue through tourism, recreational facilities and civic entrepreneurship. Farming and forestry have also been offered grants and training initiatives to encourage them to develop more sustainable and attractive practices (see ARC, 2004).

The above considers how the areas within the region have dealt with the initial impact of displacement from the early 1990s to 2004. In general, the redevelopment strategies have tended to shift displaced workers into poorly paid unsustainable jobs. This position has been compounded more recently by the economic recession, with the Appalachian region losing as many jobs as it had gained since 2000 (ARC, 2010). This feature makes the case for sustainable development in the region far more important. Indeed, more recent attempts to regenerate the region have attempted to focus more on long term sustainable strategies for the area by building on the already-existing strengths of the region (see ARC 2004 and Herzenberg et al., 2005b). They appear to fall more in line with the shift towards green development strategies, although such locally led strategies are so far poorly developed as comprehensive strategies for the region as a whole (Flaccavento, 2011). The following will consider some of the specifically ‘green’ or low carbon strategies that have been introduced and how the region is addressing skills needs in this area.

In line with the global policy drive to shift from high carbon economies to low carbon economies, more recently there has been much more of an emphasis on low carbon economy development, usually presented as ‘green’ programs as a means to diversify the economy and create jobs. Following the passing of the American Recovery and Reinvestment Act (ARRA), government money has been poured into the region to stimulate the development of ‘green’ energy jobs. The ARRA act dedicated more than $90 billion in government investment and tax incentives (one-eighth of the overall spend) to lay the foundation for a clean-energy economy (CEA 2010). As well as investments to promote energy efficiency and renewable energy generation, $1 billion went into ‘green innovation
and job training’ (CEA, 2010). Subsequently, there have been a number of initiatives to stimulate jobs in these areas and create job diversification in the Appalachia region. Key to the developments that have occurred so far is the role of NGO’s and local and regional community advocacy groups rather than state or industry-led developments. The Central Appalachian Prosperity Project (CAPP), a one-year privately funded initiative that focused on forming a plan for the ‘green’ development of the region, tracked efforts made so far by federal, state, industry, NGO’s and community advocacy groups and provided an extensive overview of all of the programs and initiatives in the region. It also identified gaps and potential investors for securing the future of ‘green’ development in the region (McIlmoil et al., 2009).

One such initiative is the JOBS project, an NGO which aims to encourage locally owned renewable energy enterprises to stimulate sustainable ‘green’ jobs in the region, specifically focusing on the reemployment of ex-coal miners in West Virginia. Recent developments have included collaboration with a privately owned local solar panel provider, Mountain View Solar and Wind, to offer privately funded job training programs for displaced workers in solar panel installation (Tyler, 2011). Fl accavento (2011) also notes the impact of the ‘green’ building initiative put in place by the Federation of Appalachian Housing Enterprises (FAHE), a community action agency that builds and renovates housing for rental and ownership in the area. High quality and efficient structuring ensures the energy efficiency of the buildings, reducing running costs for residents, and training and job opportunities have been provided in ‘green’ construction and geothermal and solar panel installation.

Indeed, in terms of the manufacturing industry, the shift to ‘green’ development and jobs should not be too difficult, replacing the jobs lost in manufacturing with jobs manufacturing components for wind and solar energy, allowing the region to make use of its manufacturing sites and history (ARC, 2007). The Renewable Energy Policy Project (REPP), for example, estimated that in Pennsylvania every 1000 MW of developed wind power could create the potential for 3,000 jobs in manufacturing alone (Sterzinger and Svrcek, 2004). This type of shift should not be too difficult and offers the opportunity to provide many ‘green’ jobs. The ARC, for example, has estimated that over 28,000 potential manufacturing jobs exist within economically distressed or at risk Appalachian counties, with the potential for 51,973 manufacturing jobs in the wind, solar, and biomass renewable energy sectors in the four Central Appalachian states of West Virginia, Kentucky, Virginia and Tennessee. This possibility is a realistic ambition because all the resources and manufacturing capabilities are already in place.

However, despite this prospect, there has so far been a shortfall in the development of manufacturing components for renewable energy technologies. In part, this is due to a lack of research into the potential and capacity for the already existing manufacturing sites to shift to ‘green’ component production. Such research is necessary to develop the appropriate strategies if the region is to take full advantage of this opportunity. Perhaps more importantly, a skills shortage in this area has also been identified. Such a shift would require little up-skilling. Most jobs in this area are similar to traditional manufacturing jobs, but the lack of political will has meant that the region has so far failed to put in place the appropriate training and education strategies and partnerships. Consequently, the region lags behind in its potential for ‘green’ development. The ARC recommends the development of outreach and education programs for those manufacturers that have been identified as having the technical capacity suitable for the transition to manufacturing renewable energy components (ARC, 2007). If States in this region were active in
upgrading skills in their current manufacturing workforce and doing the relevant research into the necessary links in their supply chains, such a strategy could both prevent further job loss in this industry and create many new jobs (White and Walsh, 2008).

Nonetheless, a number of strategies to develop low carbon technologies have been identified. White and Walsh (2008) present a potentially successful case of development in this area in Pennsylvania that is instructive of good practice. A study conducted by the Regional Economic Development District Initiatives found that small and medium sized manufacturing companies in the area were wary of investing due to uncertainty about markets for the components; there was no concern about the lack of skills amongst the potential workforce. States should therefore engage in making this assessment and actively attempting to build demand and markets for such components in the area. Once company interest is gained, the State can then put in place the training initiatives necessary, but industries have to be on board first before demand for jobs can be created. The result of this initiative in Pennsylvania has meant that one county, Lancaster, has already begun building stronger links within the supply chain for their products (White and Walsh, 2008).

In terms of developing the necessary skills, WIBs recommend that workers should be trained with broader skill sets in traditional metal manufacturing, with ‘green’ skills incorporated into existing training programs. If implemented, this would mean training and up-skilling those currently employed at the lower ends of manufacturing; most of the more skilled in this industry in Pennsylvania are shortly to retire. This shift would entail industry and local colleges developing training initiatives to address this need. Indeed, ‘green’ industries do not require vastly different skills to traditional industry per se but rather require the already existing workforce to have the most up-to-date training in advanced manufacturing techniques. This would mean developing appropriate career pathways locally through a collaborative effort between employers, unions, technical schools and workforce agencies.

White and Walsh (2008) identify an exemplary case of the wind turbine manufacturer, Gamesa, who decided to locate a manufacturing plant in Pennsylvania. The decision to locate in the region was highly influenced by the state which offered the company $22 million in various financial incentives as part of Pennsylvania’s economic development plan (Cahill, 2007). Alongside the financial incentives offered by the state, the company’s decision was also influenced by Cambria County’s highly effective regional partnership of workforce development, economic development, and local government actors. The economic development agency Johnstown Area Regional Industries (JARI), and the regions one-stop centre for workforce services, PA CareerLink Cambria County, worked together to develop a detailed skills profile of the area. This area was heavily affected by worker displacement, and the plan was to demonstrate to potential investors that the necessary skills base was available in the area. They proposed working together to select a workforce and helped to arrange and schedule interviews. Once Gamesa committed to the area, they trained the selected workforce, more than half of which were previously displaced workers.

The development of a manufacturing plant making rotor blades and towers at Fairless Hills was not so successful. Gamesa located there due to its proximity to Delaware River, as a port was necessary for transportation purposes. However, in terms of attracting a skilled workforce its location was far from ideal due to its proximity to Philadelphia, which has difficulty attracting skilled employees. This meant the plant relied on a poorly skilled
temporary workforce, with high job turnover, a situation that has now improved. This case provides an important lesson that can, if utilised properly, be used for the advantage of rural Appalachia with its history rooted in manufacturing.

In terms of addressing future skill needs, at the time of the report United Steel Workers union (USW) was in the process of negotiating for the cross-training of workers across all sectors to ensure employees have the opportunity to advance and develop their skills (White and Walsh, 2008). Lessons might be learnt from local areas developing affective partnerships and research into green development opportunities, in order to both attract investors and ensure effective training of the current workforce.

Overall, the growth of ‘green’ projects looks set to continue since they are actively encouraged by federal government. The Obama administration, in its drive to create a low carbon economy and regenerate regions of industrial decline, has contributed $6 million dollars to the Workforce West Virginia programme. The aim is to stimulate ‘green’ jobs, as well as decent jobs, as a contribution to the development of a low carbon economy in the region. The grant aims to help 1,600 West Virginians find employment in ‘green’ jobs, specifically focusing on workers that have recently been laid off. In order to promote the stimulus for these jobs, funding will be directed to train current and future workers in construction, biomass industries, retrofitting and installation and ‘green’ entrepreneurship. This will also include funds to community colleges to promote and develop courses that specifically focus on ‘green’ energy jobs (Ward, 2010). The ARC has also designated up to $40,000 each for up to ten non-profit projects offering adult training in the renewable energy and energy efficiency sector (McIlmoil et al., 2009). However, although the overview presented in the CAPP report shows promise, it notes that the ability of the region to take full advantage of these opportunities is limited by a lack of investment in skills and infrastructure in the area. More investment and collaborative effort between community colleges and industry is therefore needed to provide the skills that are required for the transition to a low carbon economy and for ‘green’ industries in particular.

6.5 The Ruhr Region

The Ruhr was once the largest industrial site in Europe, with coal and steel production playing a central role in its economic growth; these sectors were the main providers of employment in the region. This region had a prominent position in the German economy during both World Wars and the post-War period. It has become one of Europe’s most densely populated conurbations (cited in Hospers, 2004), with nearly 5.3 million people (Mehling et al., 2010). The industrial heartland of the region, known as the Hellweg Zone, consists of the cities Duisburg, Essen, Bochum, Dortmund and Unna and lies between the towns and cities located in the Lippe Zone (consisting of Wesel, Dorsten, Marl, Lünen and Hamm) and the Emscher Zone (Oberhausen, Bottrop, Gelsenkirchen and Herne). Since the 1960s, this area has experienced industrial decline.

Successive governments, usually within the context of the emerging European Union, sought to address the impact of decline and reverse these trends. The original response was limited. The approach to mine closure was to either provide large sums of compensation or persuade miners to retire early, at the age of forty-nine. The paradox was that government subsidies remained in place to train younger mine and steel workers. It was not until the 1980s that attempts to diversify the region’s economic base were made, after the world-wide coal crisis of 1974. The argument was that the region required structural change due the massive job losses that had occurred (Hospers, 2004). Despite some success with regeneration, the impact of the decline of the coal and steel industry is still felt in the region.
In 2000, the unemployment rate in the Ruhr stood at 12.2 per cent as opposed to the average of 8.1 per cent in the rest of Germany (cited in Hospers, 2004). Although unemployment rates in 2008 were closer to the national average, they remained lower than other western German regions, and disguised the lower than average rates of labour market participation (Pringle et al 2011). In dealing with the shift away from these traditional industries, governments and other policy makers attempted to diversify into the service and high-tech industries (Mehling et al., 2010).

While governments sought to address these developments by focusing on the structure and composition of the economy, more specific policies addressing the needs and wants of those affected were developed by non-government bodies, such as works councils and trade unions. One such policy was the 1998 tripartite social pact called ‘Alliance for Jobs’, comprising union representatives, business representatives, and government officials. This agreement required the stakeholders to act together to tackle unemployment following restructuring (Bispinck and Schulten, 2000). Nonetheless, government resources, particularly at a regional level, were critical for the successful implementation of these policies. Coal mining remains a key industry in the Ruhr, with 76 per cent of the 32,800 German workers employed in coal mining employed in the Ruhr Valley at the end of 2007. Plans to phase out government subsidies for coal mining by 2018 mean that the industry will see further decline and a potential 2 per cent average rise in unemployment if coal mining ends. Therefore, policies in place now are important indicators of how well the region is set to deal with the gradual demise of coal mining as an employment base (Block, 2011).

The following will explore the impact this shift has had on displaced workers and what was put in place for displaced workers to deal with this overall shift in the fortunes of the Ruhr.

6.5.1 The Region: An Overview

The Ruhr region might be described as a polycentric urban area, comprising a number of large cities/regions in close proximity to one another (often with no discernible boundary). Its area is approximately 4,435 km2. The region is part of the North Rhine Westphalia state (or Länder/federated state). The state is currently governed (2011) by a coalition of Social Democrat and Green parties. It is the most populace state of Germany with approximately 18 million people. The Ruhr region’s population is 5.2 million people and the metropolitan region is subject to a Ruhr Parliament or Regionalverband Ruhr, which is a type of regional association. The Regionalverband Ruhr comprises an affiliation of 53 towns, which is responsible for regional consensus and fair coordination of interests in the region. As mentioned above it has been largely dominated by traditional industry, and has experienced significant economic decline since the 1960s.

More broadly, Germany has often attempted to prevent displacement by promoting particular employment strategies, such as reducing working time as well as government subsidies for wages, in order to prevent earning losses. However, when displacement is considered the initial response usually included early retirement packages (Hospers, 2004, Knuth, 2010), with more proactive responses being employed only when early retirement became insufficient to deal with redundancies. When this is the case, a job transfer scheme was often employed. Such schemes usually involved attempts to mitigate the prospect of unemployment by extending the employment contract beyond the end of the notice period, using the extra time to help match workers to new occupations, engage in
training if necessary, and assist with job searches. Short-time allowances from the government have also been used to fund this process (Knuth, 2010).

The Association for Innovative Employment Promotion (Gesellschaft für innovative Beschäftigungsförderung – G.I.B) in the North-Rhine-Westphalia district of the Ruhr, for example, works to promote employment in the region. The G.I.B was founded by the federal state of North-Rhine-Westphalia in 1986, with funding from national government and European and National projects. It aims to support regional government in its battle against unemployment, including the promotion of job transfer schemes since 1996. This has entailed G.I.B going into firms undergoing redundancy and providing legal and practical advice as well as information on-the-job transfer schemes in the area. They then assisted managers and work councils3 in areas such as selecting the right transfer company, assessing skills adequacy and ensuring cost transparency. This was done using the framework of good practice that had been drawn up by the regional ‘Alliance for Jobs’ (see Bispinck and Schulten, 2000). This alliance included multi-stakeholders (government departments concerned, social partners, including the transfer companies involved, researchers, the regional branch of the Federal Employment Agency and relevant service providers). They drew up a joint statement dedicated to promoting job transfer schemes, building regional know-how about them, and improving their professional quality by initiating networks of competence and stipulating criteria for good practice and service. This gave such schemes high legitimacy for firms looking to use them to cushion workers from the negative impacts of displacement. However, the successes of such schemes were not always guaranteed, especially in cases where multinational companies were involved. These companies, via their local managers, were often unaware of the institutional context and the tools available to them to deal with such situations in any particular national setting (Knuth, 2010).

In larger companies, trade unions also played an important role in the re-structuring process. One example illustrates the way union initiatives can provide the impetus for developing a regionally-focused employment resource for displaced workers. To mitigate some of the impact of the closure of the Henrichshütte steelworks, a major employer in the Ruhr city of Dortmund, Bildungswerk Witten/Hattingen (BWH), a local trade union, established a learning partnership. It focused on continuing the training provided by Henrichshütte, providing further employment opportunities for displaced workers and developing as an independent vocational training centre, with a particular focus on the SME sector. Learning partnerships were formed with many organisations, including less conventional social partners and these partnerships sought to act within existing regional networks, thereby allowing them to influence policy. An Advisory Board, comprising experts from many regional institutions was established and as a result BWH has now evolved into an organisation that has a major input into regional education and training policy, employment policy and regional economic development. What began as a strategy developed by trade unions, therefore became more corporatist in nature involving key stakeholders in the formation of learning partnerships which were integrated into regional policy to deal with the impact of displacement (Stuart and Wallis, 2007).

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3 A works council is a form of organisation that operates at the firm level to represent workers’ interests. Generally, the works councils provide a hub for top-down and bottom up discussion, by workers (union and/or non-union affiliated) and employers, of the implementation of national agreements and the raising of local concerns.
Little is known about the direct impact of restructuring on displaced workers in the Ruhr. This may be because there is no formal strategy in place to deal with industrial restructuring. Outcomes are usually a piecemeal construction between the firm involved and the works council, shaped by employment protection laws made by central government. Thus, despite little evidence of state driven strategies to deal with the initial impact of displacement, firms, works councils and unions have so far managed to piece together responses, using employment law to guide them, although the success of such responses is difficult to measure (Knuth, 2010). However, the fact that such a strategy is in place would indicate that job displacement is kept to a minimum.


Government response to the industrial restructuring during the 1990s has tended to place an emphasis on regenerating the Ruhr to create new job opportunities by attracting investment from hi-tech and knowledge based firms; expanding the service sector and promoting local entrepreneurship (Hospers, 2004). The German provincial governments have been central to the process of shaping regeneration strategy (due to their responsibility for economic development), acting in partnerships with municipalities and private actors to cushion the negative impacts of job losses (Cary et al., 2005). The creation of Emscher Science Park is one such example.

The Emscher Science Park was developed by the IBA (Internationale Bauausstellung/International Building Exhibition), a public private partnership set up to revitalise old brownfield sites in the Emscher Valley (Hospers, 2004; Fontan, 2010). The idea was to make the region more attractive to investors whilst keeping and capitalising on the region’s heritage and assets. The park spans 800 km², comprising 17 municipalities and housing 2.5 million inhabitants. It was created and promoted by 30 professionals, who were then supervised by a board of directors representing the state, members from the municipalities involved, unions, businesses in the region, environmental actors and architects. The purpose was to ensure the involvement of civil society, entrepreneurs and municipalities in the regeneration process by inviting them to submit ideas for projects to revitalise the zone and then secure the necessary financial and technical support to execute the projects. A governance structure was created for the zone to ensure all the municipalities involved worked together to revitalise the zone. Overall, 120 projects on 93 sites were conceived and submitted by civil society organizations, actors from the private sector and communities in the Ruhr Valley.

The projects comprised:
- Environmental improvement strategies such as the elimination of toxic waste from the zone’s waterways, in order to make the region feel more attractive to live and work in.
- The creation of science and technology centres, focusing on the economic development of the area.
- Housing projects, including the construction of 2,500 new ones, renovation and improvement of 3,000 existing ones and construction schemes for low income families.
- Reconversion of old factories, mines and steel foundries.
- Creation of a landscape park.

Following its completion in 1999 ten more projects have been executed in the State, and similar experiments have been implemented in other parts of Germany. To date, there has
been no official evaluation of the impact of the project on the economic development of the region, although jobs have been created, in construction and rehabilitation; however, they have yet to develop any significant new high-quality full-time jobs. In terms of the project serving to stimulate innovative entrepreneurial behaviour from local actors, it has also not been as successful as expected, with much development still coming from the actions of private sector actors outside the region. It has proved difficult to transform the old Fordist industrial culture and traditions of the region. Many initiatives are driven by investments and actors from outside the region and mainly benefit the traditional corporate elites located there (Fontan, 2010).

6.5.3 A Transitional Regeneration?

The case of Gelsenkirchen’s transition from coal mining to solar energy

Nonetheless, the Ruhr still stands out in terms of its regeneration strategy because it has already made moves to regenerate the area in line with ecological and sustainability concerns as the IBA Emscher Park shows (Hospers, 2004). Furthermore, it was also first to recognise the potential in developing sustainable industry clusters, focusing on environmental technologies, with heavy involvement from local and regional government to co-ordinate economic, industrial, labour market and technology policy more closely together (Hospers, 2004, Pringle et al., 20011). The case of the development of city of Gelsenkirchen to a solar city is a noteworthy case for consideration.

Gelsenkirchen is Germany’s largest conurbation and a former centre of coal mining, steel production and electricity generation. Until the 1960s, more than half of the workforce in the Ruhr city of Gelsenkirchen was employed in either the coal or steel industry. During the 1950s and 1960s, these industries found it difficult to compete with new overseas operators and to meet the requirements of environmental protection legislation. This legislation had its origins in the doubling of the rates of lung cancer in the 1950s, associated with the high amount smog and dust emissions in the city. With the decline of coal and steel, the following occurred:

- Population decline: the city has lost more than 30 per cent of its population since 1960s. This decline is expected to continue for at least two more decades, with an estimated further 16 per cent decline between 2005 and 2025, as opposed to an average decline of 9.3 per cent in the rest of the Rhur region.
- Unemployment: in August 2008, the unemployment rate was 15 per cent, almost double the national average of 7.6 per cent in August 2008. At the peak of industrial decline in the 1980s, unemployment rates rose to 17 per cent. Overall employment in these industries has fallen from 28 per cent of overall employment in 1960 to 3.5 per cent of overall employment in 2006. In 2009, 20,000 people were still employed in the mining sector. In 2007, the Federal and State Governments of North Rhine Westphalia and Saarland agreed to phase out coal subsidy by 2018.

Since the decline began in the 1960s, employment has increased in the service sector but employment gains in this sector have done little to compensate for the impact of job losses from industry, reflected in the city’s higher than average unemployment rates and ageing population. In terms of addressing the issues associated with job displacement, local and federal governments shifted towards sustainable development now making the city the biggest supplier of solar energy in Europe.
Ideas to shift the region away from its dependence on these industries came from a local and State partnership during the late 1980s when industrial decline was at its peak and unemployment rates rose to 17 per cent. This shift centred on renewable energy sources and improving energy efficiency to cut carbon emissions and improve the environment with the aim of moving the city from a coal city to a solar city. Such innovations would also be employed with a particular focus on utilising renewable energy to revitalise former coalmine areas and to renovate buildings connected to the coal mining industry. This was done with the view to diversify the industrial base, providing new industry employment opportunities, and to improve the overall quality of living in the city in the hope that it will attract inward investment and skilled labour.

One such successful development was the building of Science Park Gelsenkirchen, on a former steel foundry, in 1995. The €50 million investment came from the European Union’s Regional Development Fund, the State of North Rhine Westphalia and federal level funding. A photovoltaic power plant was installed on the building’s roof in 1996, the largest in the world at the time, becoming a flagship of the Internationale Bauausstellung (IBA) Emscher Park and the solar city strategy. The science park became a centre for business and technological development, with eight out of the 45 companies and institutions based in the technology and start up centre working in the field of clean energy. This venture worked to the city's advantage; it managed to attract investment from Shell Solar, who with the help of state and federal investment and support schemes opened a solar cell factory in 1999 near the existing solar module factory. The ongoing support and development at state and federal levels has led to growth in the solar industry, with both cell and module factories owned by the local company, Scheuten Solar. Research and development into the technology has been carried out by Fraunhofer Institute for Solar Energy Systems (FhG ISE).

The development of this local solar industry has led a growing number of companies to invest in the area and engage in planning, installing, maintaining and marketing solar technologies (Jung et al., 2010). It has been predicted that the development of the solar industry in the city could create up to 1,000 new jobs within ten years (Schmitz-Borchert, 2011). Further positive impacts include the development of the first solar housing estate (Jung et al., 2010). Thus, the city perhaps demonstrates a smooth transition to sustainable development, in this respect promoting ‘green’ technologies, with government, industry and civic society behind its development. Nonetheless, it remains important to consider the degree to which this shift impacted on those that had been displaced from the old coal and steel industries.

Regular training programs were hosted and initiated by the Science Park for architects, project developers, workmen and unemployed people, including training programs for former miners (Schmitz-Borchert, 2011). Thus, the development of the science park has been central in forming an advantageous sustainable industry cluster in the region, establishing partnerships, researching opportunities and new technologies as well as providing training and educational programs. However, it has yet to make a considerable impact on the damage done with the contraction of traditional industry. This will depend on whether the partners involved can shift towards more of a strategic framework of development, rather than the ad hoc process that has guaranteed success so far at the science park (Schmitz-Borchert and Jung, 2002).

Sustainable development has therefore been promoted as a strategy to regenerate the Ruhr. More specifically, Wolfgang Jung, director of the Gelsenkirchen Science Park,
believes it is unlikely that the development of ‘green’ jobs in the region will replace the jobs that will be lost due to further decline in coal and steel (Block, 2011). Thus, even though the region has been successful in creating new job opportunities for current and future workers (Hospers, 2004, Pringle et al., 2011), it has perhaps not served those displaced from the coal and steel industries so well. Such jobs came too long after displacement occurred and often required completely new skills (Knuth, 2010). Indeed, although new jobs have been created in the Ruhr, its biggest problem remains unemployment. The structural changes that have occurred have been too slow coming, indicating that the impact that industrial restructuring has on a region is long-term (Hospers, 2004; Jesse, 2010; Pringle et al., 2011). Furthermore, the region still relies heavily on traditional industries and will therefore continue to face the challenge of developing good new job opportunities (Stock and Vogler-Ludwig, 2010). Of note, it is also necessary to consider what the region has done to enhance the skills profile necessary to enable the sustainable industrial re-structuring to take place. The question is whether or not the success story of Gelsenkirchen is something that can inform future development in the area?

Much has been done to improve the skills profile of the region. Since the 1970s the region has directed resources to develop education and skills by improving infrastructure, opening universities and investing more in research and development to help regional economic diversification. However, the reorganisation of industry has not progressed at the same pace thereby possibly limiting the expansion of jobs in the region (Pringle et al., 2011; Jesse, 2010). The German tradition of the dual vocational educational training system (VET) should also mean that the workforce is relatively well placed to make the transition to a sustainable economy. Employers merely need to integrate new skills into their current training schemes, since most jobs only require a top up of current competencies. Industries are well placed to shape this type of development (CEDEFOP, 2010a and 2010b; Stock and Vogler-Ludwig, 2010). Indeed, training for decent jobs and ‘green’ jobs is already relatively well established in the VET system in Germany, with training in such competences increasingly a part of the public education system. Nonetheless, there are areas of shortages in the environmental sector, including a shortage of engineers (CEDEFOP, 2010b).

Older workers tend to be employed in coal and steel industries. Maintaining their employability in preparation for the transition away from these industries remains a challenge. The old strategy of early retirement is no longer feasible due to Germany's overall ageing population and the increasing pressure placed on the economy to remain competitive (Spross, 2010; Naegele, 2007). More recent policy efforts include a focus on lifelong learning to address this issue (Naegele, 2007). The aim is to make workers more employable by equipping them with skills that match the demands of the labour market, not just the firm or sector where they are employed. Further issues that need addressing are the lack of development of vocational training in the renewable energy sector. Moreover, there is an absence of a strategy focused on general skills forecasting (CEDEFOP, 2010b). Additionally, there is a distinct lack of social partnerships, which would help with such developments (Stock and Vogler-Ludwig, 2010).

Despite the relative success of diversification in the region, and the promotion of sustainable and ‘green’ initiatives, the region still suffers from high unemployment rates and slow economic growth (Jesse, 2010). Issues affecting the ability of the region to take

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4 A dual education system combines vocational education for an apprenticeship course in a company and vocational school.
full advantage of sustainable development opportunities may not lie wholly with the skills of its workers but rather in the political economy of the region itself. As already mentioned, development so far has tended to benefit elites in the region. This has been attributed to the distinctly Fordist culture that has stunted local entrepreneurial development (Knuth, 2010). Furthermore, the distinctive identities of the municipalities in the region and the strong pride and attachment to place that comes with this identification prevents actors in the region from working together in a cohesive political way (Hospers, 2004, Mehling et al., 2010). Such features could be important for a shift to a ‘green’ focused economy, although the regions naming as the cultural capital of Europe in 2010, may help to develop a unified strategy as well as shift perceptions, potentially helping with investment. Thus, there appears to be hope for success in the region, but challenges remain. There is likely to be further decline of coal and steel in the region, and it is not clear how apt the strategies laid out above will be in dealing with this next phase of decline.

6.5.4 Lessons

Overall, the Ruhr region seems well placed to make a ‘green’ transition with pioneering examples of ‘green’ industry development evidenced in Emscher Science Park and the development of a green energy cluster in Gelsenkirchen. Such developments have been helped by state, federal and regional agencies investing and working in partnerships to develop such initiatives, with such partnerships also including input from businesses, unions and others (Hospers, 2004, Pringle et al., 2008). What is illustrated is the positive impact such partnerships might have. However, future developments remain key if the region is to successfully deal with the further decline of coal (Block, 2011). The ad hoc strategy has been successful so far, but may not be enough to stem the impact of further coal decline. Current financial conditions making it increasingly difficult for the Federal Government to employ early retirement strategies and short-time allowances, which have tended to limit the initial impact of job displacement in the past (Naegel, 2007, Spross, 2010). The lifelong learning strategy that has been developed to help address this issue shows promise, largely due to the well-established VET system that ensures German workers are highly skilled and familiar with learning on the job. Thus, skills development seems not to present an issue for the region to make a full ‘green’ transition.

However, as yet, there is no specific skills strategy in place and no evidence of any development of vocational training in green energy development (CEDEFOP, 2010b). Clearly, such a strategy may help the region to identify a way of dealing with further decline. Furthermore, the fact that unemployment remains an issue is perhaps telling with strategies for development coming too late despite its skilled workforce. The issue of unemployment is perhaps likely to remain unless municipalities of the Ruhr come together to devise a unified strategy to encourage further ‘green’ investment opportunities and strategies to develop growth from within the region, rather than relying on investments from outside. This would mean attempting to breakdown the inward looking mentality that has prevented municipalities in the region working effectively together in the past (Mehling et al., 2010).

6.6 South Wales Valleys

The Valleys region of Wales is one of the poorest regions in the UK. At the root of this disadvantage is the decline of industry and coal mining, which was once the core of all employment in South Wales. This decline dates back to the 1930s but has been particularly severe since the 1960s, with coal mining and metal manufacturing almost disappearing completely
by the 1990s (Rees and Stroud, 2004). The County Borough of Rhondda Cynon Taff, for example, was formally dominated by the coal mining industry. In 1947, just over 27,000 people in Rhonda Cynon Taff were employed in the mining industry. Since this time, the industry has declined considerably employing just fewer than 5,000 in 1985 and has continued to contract leaving only 1 pit remaining in the South Wales coalfield (Rhondda Cynon Taff Insight 2 cited in Beynon et al.1999a).

The fact that the decline of coal mining happened so rapidly has had major negative consequences for the region. The main strategy to deal with the initial impact of job displacement was to offer generous redundancy payments, effectively giving older miners an early retirement. However, there was little in place in terms of new employment opportunities for those ex-miners who wanted to continue work or for the future generations of workers. The jobs created during the 1970s were mainly taken by women, reflected in the high rate of male unemployment in the area. Younger displaced males did tend to find work, often in manufacturing, but the work on offer usually paid significantly less than the wages they had been paid when mining. Such developments had a knock-on effect on the rest of the regional economy. Little was put in place to stem the negative impact of colliery closures during the 1960s and 1970s. This meant that by the 1990s when coal had almost declined completely and metal manufacturing was undergoing a similar decline, the negative impact on communities was further compounded (Rees and Stroud, 2004).

Nonetheless, attempts were made to regenerate the region and more employment opportunities have been created. However, despite these numerous attempts, the Valleys suffer from the highest unemployment rate in Wales today. There are few employment opportunities available in the region and the high rates of economic inactivity amongst those claiming incapacity and sickness related benefits, mean that household incomes in the region are low. Prior to the recent recession, there were signs of recovery, but this has now ended, perhaps due to the high rates of public sector employment in the region, a sector that has been hit particularly hard by the recession (Beatty and Fothergill, 2011). Employment and unemployment rates indicate that most of the coal areas in Wales experience lower employment and higher unemployment rates than Wales as a whole.

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Employment Rate ( per cent) (2010)</th>
<th>Percentage point difference with employment in Wales (66.4 per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmarthenshire</td>
<td>66.3</td>
<td>-0.1</td>
</tr>
<tr>
<td>Bridgend</td>
<td>68.6</td>
<td>+2.2</td>
</tr>
<tr>
<td>Swansea</td>
<td>61.0</td>
<td>-5.4</td>
</tr>
<tr>
<td>Neath and Port Talbot</td>
<td>61.8</td>
<td>-4.6</td>
</tr>
<tr>
<td>Torfaen</td>
<td>65.6</td>
<td>-0.8</td>
</tr>
<tr>
<td>Rhondda Cynon Taff</td>
<td>62.3</td>
<td>-4.1</td>
</tr>
<tr>
<td>Merthyr Tydfil</td>
<td>65.3</td>
<td>-1.1</td>
</tr>
<tr>
<td>Blaenau Gwent</td>
<td>60.7</td>
<td>-5.7</td>
</tr>
<tr>
<td>Caerphilly</td>
<td>62.3</td>
<td>-4.1</td>
</tr>
<tr>
<td><strong>Welsh Average</strong></td>
<td><strong>66.4</strong></td>
<td></td>
</tr>
</tbody>
</table>

Statistics for Wales: Statistical Bulletin, Regional Economic and Labour Market Profile, 2011
Source: Labour Force Survey (LFS)/Annual Population Survey (APS), ONS, 2010
The Bridgend Authority stands out with a relatively high employment rate. This area is characterised by a number of high profile job losses as large scale manufacturers pulled out of the area (e.g. Sony). It is also characterised by a low density of high skill/high wage service employment.

Table 16. ILO Unemployment Rates Statistics for Wales

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Unemployment Rate (per cent) (2010)</th>
<th>Percentage point difference with unemployment in Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmarthenshire</td>
<td>8.2</td>
<td>-0.1</td>
</tr>
<tr>
<td>Bridgend</td>
<td>7.9</td>
<td>-0.4</td>
</tr>
<tr>
<td>Swansea</td>
<td>8.5</td>
<td>+0.2</td>
</tr>
<tr>
<td>Neath and Port Talbot</td>
<td>9.0</td>
<td>+0.7</td>
</tr>
<tr>
<td>Torfaen</td>
<td>8.8</td>
<td>+0.5</td>
</tr>
<tr>
<td>Rhondda Cynon Taff</td>
<td>11.6</td>
<td>+3.3</td>
</tr>
<tr>
<td>Merthyr Tydfil</td>
<td>11.0</td>
<td>+2.7</td>
</tr>
<tr>
<td>Blaenau Gwent</td>
<td>12.5</td>
<td>+4.2</td>
</tr>
<tr>
<td>Caerphilly</td>
<td>9.2</td>
<td>+0.9</td>
</tr>
<tr>
<td><strong>Welsh Average</strong></td>
<td><strong>8.3</strong></td>
<td></td>
</tr>
</tbody>
</table>

Statistics for Wales: Statistical Bulletin, Regional Economic and Labour Market Profile, 2011  
Source: Labour Force Survey (LFS)/Annual Population Survey (APS), ONS, 2010

Apart from the Bridgend local authority the unemployment rate is higher in the Valleys region, with some areas over three percentile points higher than the Welsh average. In the case of Bridgend, employment is more diversified than the other areas.

Economic inactivity perhaps provides a better indicator of the true extent of unemployment in the former coal areas as this includes benefit claimants such those on incapacity benefit, of which there is a higher percentage in former coal areas (Beatty and Fothergill, 2011).

Table 17. Economic Inactivity Rates (excluding students) Statistics for Wales

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Economic Inactivity (per cent) (2010)</th>
<th>Percentage point difference to economic inactivity in Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmarthenshire</td>
<td>25.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Bridgend</td>
<td>24.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Swansea</td>
<td>25.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Neath and Port Talbot</td>
<td>29.0</td>
<td>5.2</td>
</tr>
<tr>
<td>Torfaen</td>
<td>25.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Rhondda Cynon Taff</td>
<td>26.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Merthyr Tydfil</td>
<td>25.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Blaenau Gwent</td>
<td>28.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Caerphilly</td>
<td>28.6</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Welsh Average</strong></td>
<td><strong>23.8 per cent</strong></td>
<td></td>
</tr>
</tbody>
</table>

Regional Economic and Labour Market Profile, 2011  
Source: Labour Force Survey (LFS)/Annual Population Survey (APS), ONS, 2010

The disadvantage that coal areas tend to experience becomes starker when gross average weekly earnings in the coal areas are compared to the rest of the UK as the table below shows.
Table 18. Average Weekly Earnings Statistics for Wales

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Average Gross Weekly Earnings (£s) (2010)</th>
<th>Difference in £s compared to UK average (598.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmarthanshire</td>
<td>506.2</td>
<td>92.1</td>
</tr>
<tr>
<td>Bridgend</td>
<td>554.9</td>
<td>43.4</td>
</tr>
<tr>
<td>Swansea</td>
<td>496.2</td>
<td>102.1</td>
</tr>
<tr>
<td>Neath and Port Talbot</td>
<td>549.1</td>
<td>49.2</td>
</tr>
<tr>
<td>Torfaen</td>
<td>527.1</td>
<td>71.2</td>
</tr>
<tr>
<td>Rhondda Cynon Taff</td>
<td>492.0</td>
<td>106.3</td>
</tr>
<tr>
<td>Merthyr Tydfil</td>
<td>489.7</td>
<td>108.6</td>
</tr>
<tr>
<td>Blaenau Gwent</td>
<td>460.4</td>
<td>137.9</td>
</tr>
<tr>
<td>Caerphilly</td>
<td>504.3</td>
<td>94.0</td>
</tr>
<tr>
<td>UK Average</td>
<td><strong>598.3</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Welsh Average</strong></td>
<td><strong>516.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Regional Economic and Labour Market Profile, 2011
Source: Labour Force Survey (LFS)/Annual Population Survey (APS), ONS, 2010

While the Welsh average gross weekly earnings is lower that the UK average, the Valleys areas are all lower, supporting the contention that this is an area of acute economic deprivation.

Given the current economic situation and recent welfare reform on incapacity claimants, the strategies in place to regenerate the Valleys are more vital than ever to maintain and build on any progress that was made. The following outlines the strategies that have been put in place following its transition away from coal since the 1990s, before going on to address whether there is any evidence of a ‘green’ or sustainable transition strategy being employed as a means to develop the region. Consideration is also given to the scope of such a transition to provide new sustainable employment opportunities in the region.

6.6.1 Regeneration Strategies – The Programme for the Valleys

Most regeneration strategies have focused more on alleviating the overall disadvantage the region suffers from the fallout from the failed policies put in place following coal decline. There has been little attempt to focus on the direct initial impact of job displacement in the coal industry itself.

During the 1990s, the ‘Programme for the Valleys’ was proposed to regenerate the region. Introduced by the Conservative Party in 1988, it focused on providing new jobs and integrating the communities into the wider regional economy. It aimed to create employment, improve training and education, and improve quality of the environment, health and housing. These goals were to be achieved by ‘strengthening the partnerships between government, agencies, local councils, and the private and voluntary sectors under local leadership; and by increased support for local community action’. [cited in Beynon et al., 1999b]. Key players in this process were the Welsh Development Agency (WDA), local councils, the Welsh Assembly Government and the Welsh Local Government Association (WLGA), with funding provided by the Single Regeneration Budget (SRB) and the European Union (Bennett et al., 2000; Fradd and Howells, 2005).
A particular focus in this programme was to create new employment opportunities in manufacturing and services. One ambition was to shift perceptions of the region, giving it a modern image in place of the archaic image that coal seems to symbolise. Hence, there is evidence of the promotion and encouragement of hi-tech clean industries into the area. The goal was to make the region a centre for hi-tech investment, thereby encouraging further investment (Beynon et al., 1999a, Bennett et al. 2000). Incentives for inward investment were provided via regional economic policies, usually in the form of subsidies and allowances/exemptions for private companies, complemented by policies aimed at making the region appear more attractive both physically and socially to private investors. However, this reliance on private investment occurred in an environment of intense competition, between different areas in the Valleys. The outcome was that the local government authorities that made up the Valleys’ governance structure competed with each other to attract investment, creating a zero-sum approach to regeneration in the region (Rees and Stroud, 2004). Nonetheless, the region did manage to attract some investment, with multinationals such as Sony, British Airways, Bosch and Ford locating production and assembly units in the region (Welsh Office 1994 cited in Beynon et al., 1999a), many of which have now been lost to the region. Of note, these enterprises tended to be located in areas nearer to the M4 motorway corridor rather than in the coal regions themselves.

One outcome was the perception that some areas were gaining, whilst others were losing out. Moreover, perhaps due to this feeling of competition and insecurity, inward investment strategies were often regarded with suspicion. These strategies were often viewed as an imposition on the Valleys by outside actors with little stake in the local community. There was also a strong perception that firms would move elsewhere when public subsidies and support for investment ended (Rees and Stroud, 2004).

Despite attempts during the 1980s and early 1990s to create replacement jobs through inward investment in manufacturing, the biggest growth in employment in the region has been in the service sector, with public sector employment dominating. This sector tends to employ women and has therefore failed to make a dent on the high levels of male unemployment and economic inactivity in the region (Rees and Stroud, 2004). The ‘Programme for the Valleys’ has done little to provide any long term sustainable employment opportunities with unemployment remaining high, the wages offered in new jobs lower than average and the work on offer being mainly part-time and insecure. It should be noted that there has been a tendency for job growth strategies to be concerned with providing as many new jobs as possible and as fast as possible, rather than grounded in what would be suitable for ensuring the long-term sustainability of the Valleys.

Manufacturing is now undergoing a similar decline to coal and steel. In Rhondda Cynon Taff, for example, manufacturing employment fell from 27.8 per cent of the working population in 2000 to 23.3 per cent in 2004 (Robert Huggins Associates, 2006), a trend that has been developing for some time. While foreign multi-national hi-tech industries were attracted to the area through incentive packages and the promise of cheap labour, most were neither long lasting nor secure and sustainable. Dependence on cheap and skilled labour was not sufficient to maintain this inward investment, and these high-tech firms were able to move to countries where there was even cheaper labour and/or the incentives to relocate (Beynon et al., 1999a). Nonetheless without such schemes the situation in the Valleys would undoubtedly be worse (Rees and Stroud, 2004).
Partnerships also were promoted in the ‘Programme for the Valleys’ regeneration strategy. This entailed partnerships between public, private and voluntary and community sectors. Such activities reflected recognition of the importance of community involvement in regeneration strategies and thus the need for economic development to occur at a local level, rather than relying on inward investment by MNC’s. The involvement of local community and voluntary sectors was seen as vital to foster the social capital necessary to bolster the confidence of communities to shape their own futures. In terms of the success, the review of such partnerships has been mixed. On the one hand, partnerships led to the development of services that would not be viable through private provision alone and would not be affordable through state provision alone. On the other hand, competition for funding means that organisations are set against each other rather than working with each other towards a similar or shared goal. Furthermore, there was also conflict over boundary relationships and the politics of some partnerships. In the instance of partnerships that involved the Welsh Development Agency (a QUANGO abolished in 2006) there was a tendency to downplay the importance of local authorities in this process. Complementing this aspect, there was a tendency to blur accountability pathways, with a lack of clarity as to how the impact of the partnership was assessed (Beynon et al., 1999b and Bennett et al., 2000). Further, local community members sometimes felt excluded from these partnerships. Nonetheless, it remains the case that local jobs were generated out of such initiatives, albeit on a small scale (Bennett et al., 2000).

In recognition of the more successful local initiatives achieved by the partnership aspect of the ‘Programme for the Valleys’ and the precariousness of inward investment, recent regeneration strategies have made community involvement a central tenet. This feature has been central in the requirements set down the Welsh Assembly Government’s ‘Communities First’ programme as well as the programs developed under the EU’S Objective 1 programs.

### 6.6.2 Objective 1 Funding and Communities First

Many regions currently receive European funding for regeneration and sustainable development through objective 1 programs. In the case of the Valleys, this includes former coalfield areas in the following local authorities: Merthyr Tydfil, Rhonnda Cynon Taff, Caerphilly, Torfaen, Bridgend, Neath Port Talbot, Blaenau Gwent, Swansea and Carmarthenshire. The combined population of these areas in 2002 was 1.3 million (ONS, 2003). Those living in these local authority areas had felt the harsh effects coalfield closures over many years.

The designation of the area as a European Union Objective One region at the end of the 1990s, reflected the failed attempts of previous strategies and led to an increase in EU funding to regenerate the region. Objective 1 funding placed a strong emphasis on developing skills and education in order to propel the region forwards to a knowledge-based economy. This approach was in line with the general political consensus at the time that developed countries needed to regenerate and develop poorer regions to enable them to compete with the emerging so-called ‘tiger’ economies in Asia and elsewhere (cited in Rees and Stroud, 2004). Alongside Objective 1 funding the Welsh Assembly Government began to promote their ‘Communities First’ program.

As with the ‘Programme for the Valleys’, Communities First focuses on regenerating the region through partnerships, working towards building the confidence of the region, investing in education, training, improving health and housing and fostering small local
enterprises (Communities Directorate, 2001 cited in Rees and Stroud, 2004). The latter was also recognised as important by European Commissions RECHAR strategy which aimed to develop local small enterprises (Rees and Stroud, 2004). However, both Objective 1 and Communities First place a stronger emphasis on the communities themselves in developing the region, focusing particularly on partnerships between local government, business, and the third sector as a means of achieving the goals associated with economic and social regeneration. This approach reflected the then national government's aim to empower communities, allowing community members to determine and make decisions regarding what and how services are delivered (Adamson and Bromiley, 2008).

A recent assessment of Objective 1’s effectiveness at utilising partnerships to foster bottom-up regeneration found that community and third sector involvement often see government bodies erecting barriers to the kind of developments they would like to see take place. If this distortion occurs, then the programs do not really reflect equal partnership activity and perhaps undermine the initial focus on activities being developed from within communities themselves (Fudge, 2007). The corollary of this assessment is that community empowerment and involvement depends on the capacity of community members to influence such schemes, an aim of the Communities First programme. Findings from a Joseph Rowntree Foundation commissioned report found that Communities First had been successful in generating community empowerment, engagement in local decision-making and encouraging community based action. However, the inability of the Communities First programme to influence statutory agencies continued to constitute a barrier to effective community empowerment (Adamson and Bromiley, 2008). Although this is no doubt an important issue, it says little about the actual impact these initiatives have had on the target areas. It is not clear whether they have improved the overall situation in the regions. Findings suggest that although Communities First has been hugely successful in terms of capacity development, it has had little impact on key markers of deprivation, such as poor health and low educational attainment (see, Adamson and Bromiley, 2008).

Overall, the new employment opportunities developed in the area have been generally low skilled and poorly paid. A recent report concluded that between 2001 and 2008, there had been some improvement in Communities First areas, evidenced by the decline of the economically inactive population (Hincks and Robson, 2010) but it does not indicate what sort of jobs these individuals have gone into and whether or not there has been an improvement in health and education. A recent assessment of regeneration activity in Rhondda Cynon Taff shows that despite the decline in unemployment and economic inactivity, wages in the area remained significantly lower than those for both Great Britain and Wales (Robert Huggins Associates, 2006). At the time, the median gross weekly pay in Rhondda Cynon Taff was £357.50, suggesting that the jobs growth remains low skilled and poorly paid, with the majority of jobs being in services and manufacturing (Robert Huggins Associates, 2006). In turn, the poor quality housing, poor health, and low educational attainment in the region, multiply economic disadvantage and complement this pattern of job growth. This circularity makes it particularly difficult for the Valleys to attract well paid sustainable jobs, with the skills profile of the region lower than the Welsh and UK average, and with many leaving school with few qualifications.

These problems are again compounded by the fact that the traditional means of skills progression and training that were provided in the coal and the old metal industries no longer exist. Furthermore, efforts to regenerate have perhaps been slowed down because
residents in the coal communities often feel unable to shape their own destiny in these regions. This lack of empowerment is due to the wider social impact of the decline of the coal industry, which was not only central to the sense of economic well-being in these areas, but was an important factor in socially and culturally binding communities together in cohesive ways. One outcome was continued evidence of a relatively strong attachment to the remnants of a ‘mining identity’ in the Valleys with an emphasis on the male breadwinner, masculinity and gender differentiation (Rees and Stroud, 2004). In the context of continued economic and social deprivation, and the lack of a widespread and sustainable regeneration, the residents remain relatively disempowered. There is therefore a cycle of disadvantage being reproduced in the region, with the impact of industrial decline resulting in the growth of poorly paid low skilled jobs, matching the skills profile of the region, yet without providing the traditional opportunities for progression. This outcome, in turn, serves to reproduce economic disadvantage and the corresponding low levels of educational attainment, attracting only low skilled, poorly paid jobs to the region, repeating the cycle. The more recent focus on improving the human capital of the region, evidenced in Objective 1 and Communities First strategies, although doubtless important, may do little to improve the situation if job opportunities are not in place, potentially causing skilled workers to move outside of the region in order to gain employment (Gripaios and Bishop, 2006).

6.6.3 The Question of Skills

Paradoxically, skills shortages have emerged in this previously ‘skilled’ area. The 2005 future skills Wales survey indicates that there are skills shortages in a number of areas, with employers attributing vacancies in the Skilled Trades, Associate Professional and Elementary occupations, to shortages in technical and practical skills (52 per cent), customer handling skills (44 per cent), communication skills (43 per cent) and problem solving skills (41 per cent) (FutureSkillsWales, 2005). The latter three indicate that there is general shortage of the more generic skills of the skills mix. However many hard to fill vacancies were attributed to employment conditions and pay, rather than skills shortages. This was especially the case in elementary occupations such as hotels and catering. Indeed only 4 per cent of establishments attributed their hard to fill vacancies as skills shortage vacancies; these shortages were within the skilled trades and associated professional occupations.

Skills shortage vacancies accounted for 26 per cent of all Skilled Trades vacancies (compared to eight per cent of total employment) and professional occupations accounted for 23 per cent of skill shortage vacancies (compared to seven per cent of total employment). The pattern is as follows:

- 18 per cent of employers identified skills shortages within their workforce, with 58 per cent identifying problem solving as being the most lacking in their workforce, followed by customer handling 57 per cent and then other technical and practical skills 52 per cent.
- 58 per cent of the establishments surveyed provided off-the-job training to enhance skills. However, this largely depended on sector with the public sector being most likely to provide this type of training (FutureSkillsWales, 2005).

There is therefore definitely a lack of the more generic skills in the area. The fact that just over half of the establishments reporting skills gaps within their workforce attributed this to
gaps in technical and practical skills suggests that transforming current occupations and developing further sustainable occupations may not be easy. This difficulty is especially likely in the former coal areas where levels of skills and educational attainment seem to be particularly low, with higher proportions of people having no formal qualifications when compared with Wales on a whole, as the following table shows.

### Table 19. Level of highest qualification held by adults of working age in Wales, 2009

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Percentage of adults of working age with no qualifications</th>
<th>Percentage point difference with Welsh average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmarthanshire</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Bridgend</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Swansea</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Neath and Port Talbot</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Torfaen</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Rhondda Cynon Taff</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Merthyr Tydfil</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Blaenau Gwent</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Caerphilly</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Welsh Average</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

2010 Statistical Bulletin Wales the highest qualification held by working age adults. Source: Annual Population Survey 2009

When this overall picture of the situation in Wales is placed alongside the higher levels of no formal qualifications in the former coal areas, it is difficult to see how sustainable development may occur in these areas. Nonetheless, there is evidence that more recently such a strategy has been put in place.

### 6.6.4 A Sustainable Economy

Early evidence of a shift towards a more sustainable economy can be seen in the Valleys promotion of tourism. Strategies to develop this have focused on using the region’s heritage and rural beauty to help stimulate redevelopment and employment growth (Beynon et al., 1999a). Yet, along with the abovementioned regeneration strategies, the jobs developed through tourism hardly fall in line with idea of decent or ‘green’ jobs, with many jobs paying low wages and being only seasonal in nature, with little attempt to address the carbon impacts of these jobs.

More recently, however, there are signs of a shift to economic development, more in line with ideas regarding sustainability. The £30 million WAG Arbed scheme, for example, was put in place in May 2010, with the aim to ‘green’ the existing housing stock in some of the most deprived areas of Wales. In the areas formerly dependent on coal, the objective was to make the housing more energy efficient and therefore cheaper and ‘greener’ to maintain. As well as improving the housing stock and saving energy, such a scheme also falls in line with regeneration strategies for these areas aiming to boost jobs, skills and the local economy. Funding was provided for companies to carry out the upgrades, and, as part of the contract, required them to recruit locally and deliver 156 training days for every £1 million of government funding. The purpose was to help promote and develop ‘green’ skills as part of local economic revival and provide targeted employment opportunities, by
creating a coordinated and sustainable supply chain in relation to housing redevelopment. Twenty-one schemes across regeneration areas were put in place to install solar panels and heat pumps and retrofit exterior wall insulation. Examples of training strategies in former coal areas included the multi-technology project in Markham Caerphilly, which trained local people to act as energy advisors in their own community. This scheme has been promoted as part of the Assembly Government’s aim to create and sustain markets of sufficient critical mass to generate jobs, to attract investment into Wales and to stimulate growth in energy efficiency and renewable energy businesses (Welsh Government, 2010). So far the scheme has been a great success with 6,000 homes retrofitted and at least 40 small and medium sized companies being awarded grants. A further £37 million will be invested in the scheme (Welsh Government, 2011a).

Current developments also include the opening of the first ‘green’ skills training centre in Tredegar by British Gas in May 2011. The centre was developed through a partnership scheme between British Gas, the Welsh Government, Jobcentre Plus, JobMatch Wales, Summit Skills and Blaenau Gwent County Borough Council. The centre aims to train over 1,300 people each year, up-skill the existing workforce and train new apprentices in renewable technologies. This scheme includes set targets to train the long-term unemployed (Welsh Government, 2011b). Although it is not possible to tell how successful both the above mentioned schemes will be at addressing the regeneration agenda for former coal areas and shifting Wales closer towards developing a low carbon economy it would appear that both schemes represent evidence of the WAG’s commitment to such objective’s skills and regeneration strategies (see WAG, 2008a, 2008b and 2009). The schemes focus on skills and ‘green’ job development in areas with high levels of economic inactivity, viewing the development of these areas as vital to provide the skills necessary for ‘green’ development in Wales. They also address regeneration and social justice concerns, generating sustainable employment opportunities and improving the environment in which people live. Indeed, both skills and issues concerning broader regeneration strategies are encompassed in the 2009 WAG report, capturing the potential of a ‘green’ jobs strategy for Wales (WAG, 2009). Yet it is also clear that much work needs to be done to improve skills, education and training (WAG, 2008b). Furthermore, the fact such schemes have also been developed through a partnerships between businesses, government and employment services may also ensure that aims are more joined up and skills are developed to match jobs that will actually be created. Thus, current and future developments in Wales show some potential for a comprehensive jobs strategy that also addresses issues concerning regeneration. However, much work still needs to be done to address the entrenched disadvantages former coal communities in Wales face.

6.6.5 Lessons

The fact that the Welsh Valleys is still in receipt of Objective One funding is testament to the failure of regeneration strategies. Initial attempts to regenerate the Welsh Valleys following coal decline did little to soften the blow to these communities, with top-down government strategies resulting in insecure and short-lived inward investment providing poorly paid jobs, which tended to be taken by women, doing little to stem the impact coal decline has had on male employment. This resulted in a spiralling of male unemployment, and an entrenchment of disadvantage that is still felt in the region today. The more recent bottom-up approaches devised by Communities First and Objective One strategies have shown some success, yet indicators on income, health and education would suggest that much more needs to be done.
Furthermore, these communities remain vulnerable and are likely to be worse hit in times of economic recession making the case for the development of ‘green’ sustainable well-paid jobs crucial for the future success of such communities. The beginnings of a ‘green’ job strategy perhaps offers some hope in the region, but much of this success is likely to depend on how much is invested in improving educational attainment and health, allowing the region to make the most of such opportunities. Achieving this may prove to be a difficult task in a region that has suffered from a hugely diluted skills base as a result of coal decline and previous failed attempts at regeneration; huge state investment would be required. The Welsh Assembly Government ‘green’ agenda seems to recognise this need, focusing on developments in deprived areas, but it remains to be seen how successful such a strategy will be over time.

6.7 Case Study Conclusions

The decline of coal, steel and other similar industries has had a huge impact on the areas considered in this report, with high rates of unemployment and social deprivation. Efforts to regenerate these regions have so far achieved little in terms of remedying the negative repercussions of coal decline, attracting little in the way of sustainable employment opportunities and/or well-paid work. Apart from the Ruhr region of Germany, the regions covered in this report have struggled to diversify economically, with factors such as their geographic location, infrastructure and lower levels of skills making it difficult for them to attract inward investment; any investment that has been attracted has tended to move on, drawn by cheaper labour and production costs elsewhere. Problems in these former industrial communities have been compounded by government initiatives. In general, governments have not done enough to address these issues or promoted a concerted effort to remedy the broader issues surrounding a negative cycle of economic disadvantage. However, it must be noted that the areas would undoubtedly be worse off if no government strategies had been put in place.

Sustainable and ‘green’ development initiatives reflect the wider policy agenda in many countries to shift to a low carbon economy. It is therefore difficult to assess how effective such strategies will be at providing good sustainable employment opportunities, pulling these regions out of their disadvantaged positions. Such regions offer a variety of opportunities in terms of the sort of jobs that could be generated, including the ‘greening’ of local economies. With histories in manufacturing and high unemployment rates amongst men in these places, the sustainable development option, as seen in the case of the Ruhr, seems positive. However, there are huge challenges to overcome. The decline of coal, for example, had a major impact on those living in these regions, undermining their self-esteem and their power to address these challenges.

The case of the Ruhr region in Germany perhaps remains an exception to this general trajectory. The displacement from coal and steel was managed over a longer period of time and involved early retirement strategies and job transfer schemes. The works councils were key to limiting unemployment and enabling transition policies. Of note, this approach was not developed through a specific coal or steel displacement strategy, but was in line with the legal framework regarding employment protection in Germany. This case illustrates the importance of the relationship between state and society and in particular the way the legal framework impacts directly on how such situations play out. ‘Green’ development initiatives were successful in creating new job opportunities in the region, as illustrated by Gelsenkirchen’s ‘green’ energy cluster. Such a successful transition can, in part, be attributed to Germany’s dual VET system, thereby facilitating skills transition and up-skilling. One consequence is that many in the workforce were in a position to take up the opportunities that are developing in this region. This example highlights the role of government educational policies in generating the skills necessary for ‘green’ development and the transition to a low carbon economy.
The other cases place little emphasis on skills, with training usually left to private providers, who operate on limited contracts that usually leave workers with few formally recognised transferable skills, and thus limit the ease with which such regions can shift to a low carbon economy. However, despite its relative success compared to the other cases considered in this report, the Ruhr is still relatively disadvantaged compared to the rest of (western) Germany, perhaps highlighting the general concern in EU that the overall shortage in STEM skills may hamper sustainable and ‘green’ development (European Commission, 2010). Nonetheless, this feature should not detract from the success that has been achieved so far but merely serves to highlight that more needs to be done in order to make the shift to a low carbon economy in Germany.

This feature of the range of approaches to the implementation of transition strategies should be examined further. The German state, as indicated, is heavily involved with the provision of the VET system, legally compelling unions, trade and industry, and the state to provide training; hence Germany’s highly skilled workforce and the relative ease in which the Ruhr has begun to make a transition. In contrast, in the UK and US it is individual industries that are responsible for developing training and apprenticeship programs, which often leaves employees with a lack of recognised and accredited transferable skills. Moreover, there is considerable evidence to suggest that the re-skilling involved in privately provided schemes tend to be minimalist, rather than the provision of broadly-based and comprehensive skill sets. Indeed, although the other case studies offered less overall in the way of training provision, training initiatives were still central to the level of success in regeneration and the promotion of sustainable and ‘green’ development. Successful training initiatives included those that entailed a multi-stakeholder approach with training and education providers and local government/states working with businesses and their representatives to identify local training needs and then tailoring this training to the local economy. Occasionally union organisations, as exemplified by the European Metals Federation and steel training, have also contributed to these programs in positive and supportive ways, and to good effect in terms of the outcomes (Stroud, 2011; see, however, Stroud and Fairbrother, 2006, 2008 for accounts of the barriers to training and up-skilling workers in ‘traditional’ industries). Such initiatives were also evident in North Central Pennsylvania and North Carolina in Appalachia, although here there was much less evidence of an acceptance that unions should make a contribution. Such measures proved to be the most effective when strategies were also developed to support the development of industry clusters, as was the case in Gelsenkirchen and currently with the ‘green’ development of the marine sector in South West England.

Alongside these arrangements, Non Governmental Organisations (NGOs) have played a decisive role in service provision in the US. They have played an important role in ‘green’ development initiatives in Appalachia, often in collaboration with private industries to provide the necessary skills for ‘green’ development, evidenced by the work of the JOBS project. However, pressure on government spending from the recent recession perhaps puts the more successful grassroots initiatives developed by NGOs at risk of losing government funding, placing these already vulnerable areas in a precarious position in terms of successful sustainable economic development.

Furthermore, the capacity to build and attract job opportunities depends not just on the development of the right skills but also on job availability. This feature reinforces the observation that there is a mutually reinforcing relationship between infrastructural resourcing and the development of capacities in relation to jobs and skills. The relationship between industry and government and educational institutions is important if there is to be successful change and transition. Efforts to move in this direction can be seen in the case of the South West and the Ruhr but were absent in Appalachia, South Korea and Costa Rica despite the latter two’s admirable
effort to develop a ‘green’ skills strategy, albeit in different forms. The lack of ‘green’ development in relation to the Wales case is perhaps telling and can be attributed to the lack of successful regeneration strategies in place. Attempts to address this aspect through more recent public private ‘green’ training partnerships show promise, yet it must be remembered that this region has entrenched social disadvantages due to the impact of coal and steel decline and more needs to be done by the state in terms of improving health, well-being and educational attainment. Only with (devolved and Westminster government) support is the region likely to be able to be able to take full advantage of the transition to a low carbon economy, and the associated ‘green’ development opportunities.

One weakness with all these approaches is that they did not involve a planned comprehensive policy approach to displacement and economic regeneration. In all cases, these initiatives were carried out at a regional level because local government/provincial states are responsible for economic development. Although this approach tended to produce relatively successful initiatives, it resulted in uneven development and variable successes. The explanation for this unevenness is that appropriate comprehensive inclusive policies were not in place. This deficit was evident in the cases of Appalachia and the Ruhr, where expertise and knowledge gained from developing successful strategies was not transferred to other regions or municipalities elsewhere. This weakness has a lot to do with the history of the areas and therefore sensitivity to context not only institutionally, but politically in terms of how regions develop. It is an issue that needs further consideration if transitional development is to become more than a regional/municipal phenomenon.

The overall national institutional framework in which ‘green’ and related transitional developments occur is also crucial; with concerted effort from central government a necessary condition to put in place incentives, as well as promoting and underwriting the strategies developed at a regional level. Therefore, it must also be noted that low carbon transition in general may be uneven despite national and international agenda due to the variable readiness of some regions compared with others. Thus issues of context are, perhaps, always important in determining how well any region, or indeed country takes advantage of these development opportunities. Unfortunately, commitment to ‘green’ development or a transitional programme is uneven globally, evidenced in the amount of money that governments choose to direct into it.

There are, then, a complex set of conditions for transitional change in a low carbon direction. On the one hand, change is rooted in the specific profile of local economies, and the associated skills and jobs arrangements in localities and regions. Initiatives involve a cluster of agencies and organisations, including regional governance bodies, local authorities, employer and trade union organisations, locally based groups and educational and training bodies. On the other hand, such arrangements are often minimalist, ad hoc and stop-gap in the absence of grounded governance arrangements and the lack of nationally supported and resourced financial and infrastructure arrangements. Nation state involvement in skills strategies is therefore, also important to achieve transition to a low carbon economy.
Key findings:

1. Many countries face similar problems and experiences to those of the Latrobe Valley region
2. Most regions have struggled to remedy the negative effects of decline and closure of major industries
3. Apart from the Ruhr region, all regions have struggled to diversify economically
4. Government action and involvement is uneven but is critical to positive outcomes
5. Policy focus on such regions seems to provide opportunities to develop transition programs towards low carbon economies
6. Success is highly specific and critically involve:
   a. Early retirement strategies and job transfer schemes
   b. Planned state policies and practices
   c. ‘Green’ development initiatives to create jobs
   d. Successful training and education schemes which have multi-stakeholder involvement, including education and training bodies, business, government and unions and NGOs
   e. Recognition that:
      • appropriate job transfer depends on both skills and opportunity
      • employment adjustment depends on multi-level government involvement working with regional stakeholders.

Recommendation 11

That employment adjustment programs elsewhere should be examined and evaluated to determine the drivers of success.
7. Priority Areas for Policy Responses

The Latrobe Valley’s coal-fired power generation industry and its workforce are likely to confront major challenges as Australia takes steps to decarbonise its economy. There are signs that workers are already being displaced as power generators reduce their maintenance requirements in response to carbon pricing and the contract for closure initiative in which three Latrobe Valley generators have expressed interest. The loss of jobs and the displacement of workers brought about by these changes are likely to intensify over the coming years. A variety of social mitigation, job creation interventions and skills development and training initiatives will be needed to assist displaced workers and boost regional economic development.

7.1 Key Themes

The power industry is defined as a flexible network organisation. Such an organisation comprises a core or set of lead firms, supplemented and supported by three sets of organisation: continuous presence contractors, independent contractors, and sub-contractors to the main contractors. With this conceptualisation as the starting point, the report presents a political economy of skills approach to unpack the challenges confronting workers in carbon-exposed regions as they transition to a low carbon economy. As discussed in the methods and approach section, developing a political economy of skills allows us to consider not only skills but also various types of employment condition for these skills, their remuneration, and how these particular circumstances contribute to a particular reproduction of the household. It also permits us to consider particular options these households face if a working member of the household is displaced. By integrating this political economy approach with an organisational analysis of the power generation industry based on flexible network organisations, a set of critical issues for policy development can be identified. This approach allows the development of a regionally appropriate worker transition strategy. At the heart of this strategy must be specific and targeted policy and training measures for each of the components of the flexible network organisation that characterise the industry.

Generator jobs are relatively well paid, secure and full-time, with opportunities for overtime payments. Many of the skills required for jobs with the generators and associated mines are transferable to other similar industries although some very narrow skill sets that can limit job prospects outside the industry. Workers who manage to secure work within the generators tend to hold onto these jobs; for many they were accessed as ‘jobs for life’. The implication is that if these workers are displaced and have to apply for a position elsewhere their employment history would be limited and could be a barrier to securing another job. The greatest challenge for all these workers will be finding local employment with comparable remuneration. Households accustomed to this reliable income stream may struggle to make adjustments. Among this category of workers, the male breadwinner model is prevalent, with many female partners not involved in paid employment and where so often without recognised qualifications. The opportunity for such household members to easily secure well paid full-time employment, as a way to supplement the decline in household income, therefore, is not great.

The activity of contractors can be distinguished in two ways. First, a number of contractors are tied to generator companies via steady and relatively continuous work. The jobs in these contractors tend to be well paid, full-time and secure. Examples of such contract companies include security, emergency services, and the like. Within this category, some companies are more dependent on the power industry than others. For the less dependent companies, the closure of a power generator will create hardship but not necessarily the collapse of their enterprise. Nonetheless, there is likely to be a reduction in labour costs through layoffs and/or cuts to overtime payments
and/or wages. Some of the skills among the workers are likely to be highly specialized (for example covering dredger or conveyor belt maintenance). Much of this work is standard employment (9.00 am – 5.00 pm) as opposed to shift work and is not as highly paid as generator and related employment. The male breadwinner model is not as evident, with a second income often making a significant contribution to the household economy. In this situation the skills, remuneration and job of the person providing the second income are important considerations in developing assistance packages and understanding worker behaviour when dealing with job loss (e.g. the decision to migrate).

Second, there is a category of work that is highly paid and highly skilled but highly irregular. This is work that is associated with outages, maintenance routines, and unexpected maintenance problems that emerge from and are associated with the operation of generators. Such work may last one week to several months. Workers in these categories tend to have transferable skills and pickup employment in a range of industries. Where such workers have been employed by a range of employers and worksites they tend to be younger and also to know how to manage fluctuations in labour market demand. Further, younger contract workers without dependents and fewer family and community ties are more likely to consider migrating for work, with similar remuneration levels. For these workers FIFO is a slightly more attractive option but nonetheless is still largely seen as a last resort. As workers in this category grow older they tend to seek more reliable full-time work locally often with the goal of securing permanent work with a continuous presence contractor or a generator. The large number of applicants received by continuous presence contractors and generators is a reflection of this ambition. Often such applicants are employed in the casualised contract labour pool.

More highly qualified workers in generator companies, such as technical experts, engineers, finance and HR workers, are also likely to be affected by closure of generators. Although these workers have skills that are more transferable than lower qualified operators, there will be a limited supply of available jobs in the region unless new enterprises are established which require their skills.

Women workers tend to be concentrated in feminised occupations (professional administration, HR management, and so forth) irrespective of company type. Among the three categories, most women are employed in the contractor category due to the larger number of companies that make up this category. These women workers are typically employed in administrative and clerical positions. This work, however, tends to be more casualised than in the generator companies, with less opportunity for career progression. Nonetheless, it is noteworthy that the skills acquired by such workers in the day-to-day responsibilities of scheduling and organising meetings, assisting in report and contract writing, and book keeping tasks should not be underestimated. Further, there is plenty of opportunity for the accreditation and up-skilling of these workers to assist them in transitioning to more secure and possibly better paid positions, in other industries or sectors within the region. Moreover, there is no logical reason why women should only go into female occupations or want to do so.

7.2 Transition strategies for vulnerable workers

Using the findings from the research carried out in Phase 1 of this project, the Phase 2 project will aim to identify transition strategies to re-skill vulnerable workers into employment particularly associated with carbon abatement opportunities in the Latrobe Valley. However, on the basis of the current study, including the international comparison, the following assessment and implications are made regarding the immediate transition needs of vulnerable workers.
7.2.1 Policy

The study raises questions about policy formulations and implementation, particularly in relation to skills profiles, skills recognition and skills acquisition. The international evidence is overwhelming that within geographic regions the closure of industry, and the consequent social and economic disruption, often has major negative impacts on skills profiles of the region. In such regions, governments, employers and trade unions have each sought to promote, and where appropriate, implement policies to address these concerns. In turn, this requires recognition of the types of policies and programs that may best ensure the maintenance and further development of skills suited to the regional profile of work and employment. In this context, it is desirable that all policy initiatives are explicitly informed by a recognition that there are three distinct types of response to address displacement – reactive, dispersed and comprehensive (see section 6.3.2) - and that each have different implications for outcomes. The international evidence is clear on the outcomes of these responses. It is also evident from both worker and employer statements that they need and expect ‘comprehensive’ responses to the transition that is underway. This evidence is based in their experience in the Latrobe Valley over the last two decades and the perception (and material evidence) that the transition heralded by privatisation was both traumatic and completely inadequate.

7.2.2 Worker Displacement

In the likely scenario that one or more power generators cease to operate, at least in their current form, minimizing worker displacement must be given priority, and a corollary of this commitment is that workers should be provided with opportunities to maintain their skill base and be remunerated accordingly. The stability of the workforce in the generators has the consequence that a number of power workers are relatively close to retirement and are unlikely to want to seek alternative employment in the event of closure. Others, in the age bracket 40 to 50 years, have skills as power operators but do not necessarily have the accredited or recognised qualifications to secure work outside the industry. Of note, these workers were aware of the difficulties they may face. For the older workers, it will be important that ‘Retirement and early retirement schemes should be put in place prior to closure’. Such schemes are critical to ensure an orderly transition from current arrangements and provision. To ensure that these schemes are effective requires anticipation, preparation, planning and implementation. The question is how to facilitate transition at an individual as well as in collective ways? Employers should be encouraged to develop such schemes in consultation with relevant unions. These schemes should be put in place by the companies, following the normal industrial relations procedures that apply. One of the measures that may help with such schemes is that they are overseen by the Latrobe Valley Transition Committee to ensure consistency and effectiveness.

Many workers indicated that they are aware that they face uncertain futures. There is considerable evidence to show that compulsory arrangements create grievance and anxiety, and resentment, whereas voluntary arrangements allow workers to make choices about their own future, within the constraints they face (Stroud and Fairbrother, 2011). Hence, ‘voluntary departure packages should be established for all workers employed by the generator or generators signalled for closure’. Such departure packages allow for positive engagement and preparation.

The contract workers, in contrast, were more diverse, with many having worked for other employers and in different industries during their careers. Nonetheless, both the
owners/managers in the contract companies and the workers were aware that they also faced uncertain futures, and particularly those in companies that were heavily reliant on the generator companies for their continued operation. Hence, ‘early retirement and voluntary departure packages should be extended to contract companies, particularly continuous presence contractors, associated with the generator(s) signalled for closure’.

The power industry operates as a ‘flexible network’ comprising the power companies, the ‘continuous presence contractors’ and others. In effect when addressing the power industry, plans and preparations should include the power companies and the contractors. As indicated in section 3.1, they are inter-linked and inter-related and thus all are part of the arrangements and changes that will take place. For this reason the departure packages should include all involved, otherwise a second and severely disadvantaged tier will be created, to the detriment of individuals, the locality and the industry. These packages should be put in place by the companies, following the normal industrial relations procedures that apply. To ensure consistency and effectiveness such arrangements should be reported to the Latrobe Valley Transition Committee.

If appropriate policies are developed for retirement and voluntary departure, then this reinforces the capacity of the power industry to retain a skilled workforce, via the retention of current workers and recruitment of others. To address this feature, ‘early retirement and voluntary departure schemes should be extended to other generators and continuous presence contractors not targeted for closure’. As demonstrated, all the generators and contractors are part of the power industry. The impact on one generator and set of contractors will have implications for the industry as a whole, the way it recomposes itself, and movement between generators, mines and other sets of activity. It is an outcome of the research that the industry should be assessed as a whole and that the plans and proposals that follow from this recognition should also be integrated and linked. These schemes should be put in place by the companies, following the normal industrial relations procedures that apply. They should be reported to the Latrobe Valley Transition Committee. The generator companies, in consultation with the Latrobe Valley Transition Committee, could put such a scheme in place.

One of the major worries for workers from the generators and the contract company workers is future employment. Given the relatively integrated arrangements between generating companies and the contract companies, as well as the de facto arrangements in the power industry labour market that comprises generator and mining work in the Latrobe Valley, consideration should be given to this aspect of employment in the Valley. One possibility is that ‘a job transfer scheme should be offered for workers displaced from the closure of a power generator and its associated contract companies’, thereby learning lessons internationally (see Herzenberg et al., 2005b and section 6.3.2). In general, workers displaced through forced redundancies should be assisted and given preference in obtaining transferable occupations with other power generators or affiliated contract companies when job vacancies emerge. The research indicates the importance of such a scheme, and the desirability of facilitating planned, supported and mentored movement between power industry employees. International examples also underwrite the importance of such schemes. Such a scheme could be put in place by the companies, with appropriate reference to the Latrobe Valley Transition Committee.

Incentives could be offered to companies for the transfer system on the grounds that this is a way of retaining the skilled workforce that currently comprises the flexible networked organisation workforce. In this respect, ‘financial support should be offered to generator companies and affiliated contract companies participating in the job transfer scheme
where substantial re-training of workers into new occupations can be demonstrated. Such support is a direct consequence of the previous item and should be provided through appropriate government agencies. One lesson from the international comparison is that retraining is crucial to enable transition to take place. In this respect, higher and further education organizations have a major contribution to make although the different ways in which these organizations operate, in a dual structure (such as Germany) and more market based (UK) matter and impact on outcomes. In general, the state plays a crucial role in shaping, facilitating and stimulating re-training.

One way of facilitating the maintenance of a skilled workforce in the Valley and the industry is by ensuring that where possible, power workers are offered jobs within the industry if their generator is in line for closure. Equally, closure will be planned and supported and there is an ethical obligation to ensure that the skilled workers that lose their jobs have opportunities to find comparable work within the industry that remains in place or comparable workplaces. Hence, ‘companies that receive a contract for closure should be required to develop a job relocation scheme’. Such a requirement is the corollary of receiving state funding. These types of obligation are evident elsewhere and there is no reasonable case for exemption of the power industry in the Latrobe Valley. To enable such a process to take place, it is important that decisions about relocation are informed by appropriate skills profiles. For this reason, ‘companies that receive a contract for closure should be required to complete a comprehensive skills audit of their workforce and assist workers obtain accreditation for the skills they have acquired on-the-job’. Without a skills audit it is not possible to develop transition programs and enable transition. The international comparison demonstrates that such audits are critical for success. In addition, the power industry research indicates that many workers hold no credentials and thus are ill-equipped to make transitions. Retraining for these workers could include courses to develop the necessary foundation skills to participate in a modern economy. One consequence of the lack of credentials is that fly-in fly-out arrangements become attractive, with negative impacts on the local economy. Following on from such matters and the previous item, TAFE and appropriate Registered Training Organisations could be engaged and financially supported to assist with this process. Skills audits should be made available to the Latrobe Valley Transition Committee for consideration.

7.2.3 Job creation and worker assistance

In the event of closure and cutback, workers often require assistance and support to make the transition to new employment. There was a general recognition in all worker interviews, whether employed in the generators or mines or by contractor companies, that the skill profile of the area was under threat. These workers recognised that finding transferable occupations at a similar rate of pay will be difficult in the short-term (section 5.3 and 5.4). Further, many realised that their skills were not accredited in any formal way and did not provide the basis for job searches in the area. Many reluctantly referred to the possibility of having to seek employment outside the Valley and often interstate in the resource regions in the north. Indeed, many were graphic in their hostility to this latter prospect; it was a path of last resort, with perceived and worrisome social costs (section 5.3).

To address these problems and facilitate a humane process of transition, ‘an initiative to establish and operate a Workers’ Transitional Centre providing a locally-based and focused resource for counselling and training’. There are many examples around the world of such centres, although most were established after closure and mass displacement
(section 6.5.1). Evidence demonstrates that these centres play a positive role in facilitating and enabling transition to take place for the benefit of both employers and employees. In addition, such centres often act as a broker for training programs, working positively with training providers. Further, such centres are de facto skills centres, not only facilitating the transfer to like jobs as well as preparing for transfer to different sectors and/or occupations.

Such a ‘Centre could promote re-training of displaced workers for meaningful long-term work’. Re-training schemes are often accessed with hesitation and a degree of scepticism due to their appropriateness and/or quality of training. Re-training schemes must fulfil the expectations and career aspirations of workers and they must be sensitive to the differences among workers. Older workers, for example, may be interested and able to re-train to become specialist teachers or trainers in the TAFE sector or private RTO while younger workers may be seeking to acquire advanced accreditations to improve their prospects of finding a similar type of occupation.

A ‘Centre should not only address displaced employees but also households’. It could provide improved counselling support for displaced workers and members of households affected by a displaced worker (section 3.3). Access and assistance to displaced workers must be extended to include other household members. It is difficult for displaced workers who are not redeployed by other generators to find work locally that provides a similar remuneration. In these situations, households reliant on incomes originating from the power generation sector will experience significant adjustments. Based upon current labour market trends, other members of the household may find it easier to secure paid employment than those displaced from the power generation sector. Eligibility for re-training, up-skilling and job search support should be extended to these other adult members of the household. Training programs should be sensitive to the different needs of workers, in terms of life cycle concerns. Training could be extended beyond specific workplace skills, to include small business skills, entrepreneurship, and so forth. Such a Centre would be able to advise on job preparation. Many of the workers directly employed by the generators have not known any other job. These workers will find it difficult applying and being interviewed for advertised positions. They will need professional assistance in CV writing, job applications and interviewing skills. A one-stop-shop Worker Transition Centre that provides expert advice and assistance to displaced workers would provide such support.

7.2.4 Employment adjustment

There was frequent reference in interviews by employers and employees to the Valley and its resources. Further, in policy statement after policy statement about the Valley, reference is made to the alternative uses of coal. Behind these observations and pronouncements a set of assumptions are made about the skills base in the Valley and its future deployment. ‘The transition that is underway could be promoted as part of an employment adjustment program for the region, under the auspices of the Latrobe Valley Transition Committee’. Such a program should have skills at its core because without the recognition of current skills profiles, accreditation and recognition of skills, and advice on job searches and opportunities that match skills, the process of transition is likely to be flawed, as indicated in the international study. Already at an informal level, elements of this process are underway. However, there is a danger that unless these practices are formalised and supported they will result in rather ad hoc and dispersed responses.
If an employment adjustment program was implemented, it would be important to focus on those areas where displaced workers are likely to acquire work with similar remuneration. Such a focus draws attention to the importance in policy formulation and implementation of proceeding from a clear and evidence based profile of skills, skills futures and skills transformation. Projects involving the revitalisation of former mining areas for other economic activity could fulfill such expectations. Such an economic revitalisation and job creation package should build upon the current work being undertaken by various forms of government, particularly the State Government's Latrobe Valley Roadmap. It should also involve all stakeholders as equal partners in the process and the formulation of programs (on the benefits of this type of involvement, see section 6.5.1)

7.2.5 Alternative Site Development

The prospects for large investment projects in the brown coal industry are good but are unlikely to be operational by the time closures are occurring. Large investments outside the coal sector that would generate equivalent jobs and remuneration are also doubtful over the next 2-3 years. Short to medium-term job creation programs will therefore need to be supported. The Latrobe Valley Transition Committee may be an appropriate body to ensure the involvement of the appropriate public and private bodies. There are several initiatives that could be planned, evaluated and where appropriate implemented. One initiative that is identified in the International Report, and relatively common in Germany, is the development of old industrial sites as heritage and related activity and resource centres (for one possibility see section 6.5.2). While not having a direct implication in terms of skills development and transformation, such activities can lead to the involvement of power industry employees, drawing on current skills and developing new ones. Hence, one way of moving in this direction is to look to the ‘rehabilitation of mining and power generation sites as part of closure arrangements, with appropriate staff training’.

As indicated elsewhere, rehabilitation and the creation of purpose focused sites are a core part of effective transition. Such activity raises questions about planning, redevelopment, and outcomes. Preference for Latrobe Valley contractors and displaced workers could be enforced for work associated with the shutdown, closure and possible demolition of power generation facilities. Depending upon how closure is negotiated, displaced workers may need to be trained and accredited in areas specific to demolition, recycling and safe handling of industrial materials, and mine closure. In turn this could lead, for appropriate buildings and sites to ‘the redesign and retro-fitting of disused power generation facilities (e.g. workshops) for alternative purposes’. The use of buildings in these ways have been very successful elsewhere, in the steel cities of Germany, railway workshops in Sydney, and some of the heritage parks in the US. A number of possibilities in the Latrobe Valley are as follows: Business incubators in the manufacturing and mining maintenance field, for example, could be established in former power industry buildings as a way to promote new light industry and socio-economic regeneration. Another possibility is that facilities and sites are redeveloped as recreational and related sites.
8. Recommendations

The following targeted recommendations aim to provide guidance to governments, companies, training providers, unions and workers in managing the transition to a low carbon economy in the Latrobe Valley, particularly with respect to skills profiles and skills development. They are derived from the assessment and are in line with the specific remit of the project.

8.1 Immediate Transition Actions

Policy Focus and Assumptions

8.1.1 That steps be taken, possibly by the Latrobe Valley Transition Committee in the first instance, to integrate the diversely sourced reports and recommendations on the Latrobe Valley (and Gippsland) with a view to developing integrated and cohesive policies for the transition of vulnerable workers.

8.1.2 That policy on skills acquisition, skills recognition and up-skilling be premised on the understanding of socio-demographics of the workforce in the power generation industry, and that a critical and essential focus is one that recognises and understands the household composition and the remuneration patterns that sustain households.

Job Roles and Skills

8.1.3 That steps be taken, possibly by the Latrobe Valley Transition Committee in the first instance, to promote integrated and cohesive policies and practices on skills acquisition, skills recognition and up-skilling for possible emergent opportunities in the overall regional economy of ‘green’ and/or sustainable jobs as well as decent jobs in the future power and coal industry.

Addressing Transition in the Power Generator Industry

8.1.4 That the options for a job transfer scheme for workers displaced following the closure of a power generator and any associated contract companies should be considered as part of the contract for closure and a structural adjustment package, with skills at its core.

8.1.5 An audit of regional education providers should be conducted to assess their capability and capacities to respond to relevant training and retraining requirements, including the recognition of prior learning.

8.1.6 Attention should be given to the ways in which training and reskilling can be supported in the region in a relevant and appropriate manner, including the financial arrangements for such schemes, for the education and training bodies as well as workers and household members.

8.1.7 Consideration should be given to outlining and publicising the components and details of a planned, managed and ‘just’ transition, with skills at its core. To address this proposal, governments should examine options for the development of a ‘Workers’ Transitional Centre’.

8.1.8 That any transition program should be designed with the whole region as the reference, including the development of a regional plan that addresses all sectors; the Latrobe Valley Transition Committee should oversee this task.
Lessons from Elsewhere

8.1.9 That employment adjustment programs elsewhere should be examined and evaluated to determine the drivers of success.

8.2 Project Phase II: Jobs and Skills transition for the Latrobe Valley

That Phase II of this project should proceed to identify and map the roles and skills required to deliver the region’s Low Carbon Growth Plan in the context of the region’s industry growth trajectory.

The current report is the first stage in a comprehensive skills audit and analysis of the Latrobe Valley, and by extension Gippsland. It develops the methodology for such work, and has proven the viability of the procedures that have been put in place for such work. Leveraging on the information presented within this report, further research is required to map the roles and skills required for the region to implement its Low Carbon Growth Plan and other emerging industry development opportunities.

These roles and skills should then be mapped to existing roles and skills identified in this report. The approach to this work will be to identify the key opportunities for the existing workforce to upskill and establish priority actions for the Government to support this transition. The project should have the following objectives:

- Produce an inventory of the skills and job roles that are most important to realising regional economic development and low carbon growth opportunities, based on informed analysis and validation. Such an inventory has recently been produced by the project team and this process will leverage on this work and refine the inventory tool.

- Assess the absences in the local supply of post-secondary education and training - the targeted approach will enable the report to make findings that relate to specific institutions and courses, which will be of value to both the government and potentially, the institutions consulted by the project.

- Identify profile of the current provision, identify gaps and provide advice on what government can and should do to address the gaps.

- Investigate how the ageing workforce might engage in training and re-skilling for the region’s future and how the abatement opportunities might deliver workers’ expectations in new jobs with appropriate remuneration

- Provide practical recommendations that are attuned to the role of the government in the post-secondary education and training sector. Recommended government responses will be calibrated according to the education sector (higher education, VET or other) and other contextual factors (for example, the likely Commonwealth role and urgency needed relative to the size of the requirements for a skills transition).
References


Central Gippsland TAFE (2004) *Emerging skills shortages in the power generation industry* Morwell: Central Gippsland TAFE.


ONS (Office of National Statistics UK) 2003


Activity in Gippsland’s Climate Change & Low Carbon Transition Sector
Introduction

Purpose
The purpose of this document is to provide an overview of groups or projects which are, in some way, either responding to the impact of climate change in the Gippsland region or are positioning the region for a transition to a low carbon future. It has been prepared by the Gippsland Climate Change Network (GCCN), a not for profit organisation that works across government, business and community groups on climate change issues within Gippsland, with support from Latrobe City Council and the Department of Sustainability and Environment.

Scope and limitations of groups and activities documented

- the groups and activities included are either entirely, or in some part, focussed on responding to climate change or low carbon transition
- the included groups and activities either operate across the whole Gippsland region or a significant part of it, or their operations have an impact on the whole Gippsland region or a substantial part of it
- for the purposes of this document the Gippsland region is considered to consist of the six Local Government Areas: Baw Baw Shire, Bass Coast Shire, East Gippsland Shire, Latrobe City, South Gippsland Shire and Wellington Shire
- the document includes groups and projects which are currently in operation or about to begin operation
- the groups and projects listed do not include those which operate only in a small area of the region (such as a single LGA area) unless they have an impact on the wider region
- the groups and projects do not include those which are in some stage of development
- Community organisations working in the field have not been presented in this document, but can be found in the GCCN’s Sustainability Stocktake 2010.

Document structure:

- Summary Table
  The summary table gives a brief overview of all the groups and projects described, including contact details
- Groups
  Provides details on groups with regional responsibilities or which operate across the region or a significant portion of it
- Projects Underway
  Lists current projects under the sub-headings Adaptation, Mitigation and Education/Research
- Projects Proposed
  Lists projects which are about to be commenced

Regular review
The document will be updated as more information comes to light. Present entries will be reviewed regularly to ensure the document contains accurate information.

Contact
Please direct any comments, revisions or information about further groups and projects to:
Scott Ferraro scott.ferraro@epa.vic.gov.au Ph: 51739800
Harry Freeman harry.freeman@rmit.edu.au
## Summary Table

Summary of groups and projects in table format

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Membership</th>
<th>Purpose/ role</th>
<th>Contact</th>
</tr>
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<tbody>
<tr>
<td><strong>Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agribusiness Gippsland</td>
<td>9 member board representing 2500 stakeholders</td>
<td>A peak body for the agriculture industry in Gippsland</td>
<td>Alex Arbuthnot, chairman, Susan Webster, executive officer</td>
</tr>
<tr>
<td>Clean Coal Victoria</td>
<td>State Government Statutory Authority established by the DPI</td>
<td>A program to develop ways of exploiting Victoria’s coal resources at reduced carbon pollution levels</td>
<td>Charlie Speirs, <a href="mailto:charlie.speirs@dpi.vic.gov.au">charlie.speirs@dpi.vic.gov.au</a></td>
</tr>
<tr>
<td>Committee for Gippsland</td>
<td>A board of local business representatives</td>
<td>A peak body for business in the Gippsland region.</td>
<td>Chairman: Harry Rijs, Exec Officer: Mary Aldred</td>
</tr>
<tr>
<td>DSE Climate Change &amp; Sustainability Services</td>
<td>Programs run by regional Department of Sustainability and Environment</td>
<td>3 programs to assist local communities to respond to climate change</td>
<td>Tania Brooker, email: <a href="mailto:tania.brooker@dse.vic.gov.au">tania.brooker@dse.vic.gov.au</a></td>
</tr>
<tr>
<td>East Gippsland Catchment Management Authority</td>
<td>Directed by a skills based Board appointed by State Government</td>
<td>Waterway and catchment management in East Gippsland</td>
<td>Susan Davies <a href="mailto:susand@eicoop.com.au">susand@eicoop.com.au</a></td>
</tr>
<tr>
<td>Energy Innovation Coop</td>
<td>A community group in Bass Coast, South Gippsland and Cardinia</td>
<td>Promoting use of renewable energy and more sustainable living</td>
<td></td>
</tr>
<tr>
<td>Gippsland Climate Change Network (\text{GCCN})</td>
<td>Members from state and local government departments and agencies, industry, unions and community</td>
<td>An organisation linking a wide range of groups responding to climate change across the region</td>
<td>Executive officer: Scott Ferraro, <a href="mailto:scott.ferraro@epa.vic.gov.au">scott.ferraro@epa.vic.gov.au</a></td>
</tr>
<tr>
<td>Gippsland Education for Sustainability Network</td>
<td>Members from schools, adult learning, Monash and TAFE</td>
<td>A network for linking and developing sustainable education at all levels across Gippsland</td>
<td>convener, Barbara Johnson, <a href="mailto:argyle@wideband.net.au">argyle@wideband.net.au</a></td>
</tr>
<tr>
<td>Gippsland Integrated Natural Resources Forum (\text{GINRF})</td>
<td>All the region’s natural resource managers</td>
<td>Fosters strategic collaboration between natural resource managers in the region</td>
<td>Scott Ferraro, <a href="mailto:scott.ferraro@epa.vic.gov.au">scott.ferraro@epa.vic.gov.au</a></td>
</tr>
<tr>
<td>Gippsland Regional Management Forum (\text{GRMF})</td>
<td>Regional managers, shire CEOs, Monash Uni &amp; GINRF reps</td>
<td>Facilitate collaboration between State Government Departments and LGAs</td>
<td>Kathleen Malone, <a href="mailto:Kathleen.malone@dpcd.vic.gov.au">Kathleen.malone@dpcd.vic.gov.au</a></td>
</tr>
<tr>
<td>Gippsland Regional Plan Working Groups</td>
<td>Groups include state &amp; local government representatives.</td>
<td>Includes Centre for Sustainable Technologies &amp; Gippsland Low Carbon Economy Transition Plan</td>
<td>Kathleen Malone, <a href="mailto:Kathleen.malone@dpcd.vic.gov.au">Kathleen.malone@dpcd.vic.gov.au</a></td>
</tr>
<tr>
<td>Gippsland Regional Waste Management Group</td>
<td>A state government statutory authority</td>
<td>Advances reduction of waste and more efficient resource use</td>
<td>Matthew Peake, <a href="mailto:adminrwm@dcsi.net.au">adminrwm@dcsi.net.au</a></td>
</tr>
<tr>
<td>Gippsland Sustainable Agriculture Network</td>
<td>Members of agriculture industry in region</td>
<td>Promotes sustainable regional agricultural production and land management</td>
<td>Nick Dudley, <a href="mailto:westgippy@wgcmva.vic.gov.au">westgippy@wgcmva.vic.gov.au</a></td>
</tr>
<tr>
<td>Latrobe City Climate Change Committee</td>
<td>Reps from council, community, education, industry, unions and state agencies</td>
<td>Promotes the activities of Latrobe City in addressing climate change</td>
<td>Kevin Roberts, <a href="mailto:kevinro@latrobe.vic.gov.au">kevinro@latrobe.vic.gov.au</a></td>
</tr>
<tr>
<td>Low Carbon Emissions Future Transition Committee</td>
<td>Reps from Latrobe City council, industry, business, education, state &amp; federal government</td>
<td>To support Latrobe City council in implementing the Gippsland Low Carbon Economy Transition Plan</td>
<td>Alison Jones, <a href="mailto:allisonp@latrobe.vic.gov.au">allisonp@latrobe.vic.gov.au</a></td>
</tr>
<tr>
<td>Regional Development Australia, Gippsland</td>
<td>Reps of local councils, business, industry, education and community.</td>
<td>Implementing Regional Plan across three levels of Government. Supports RDA and other activities through Regional Growth Plan</td>
<td>Dianne Carson, <a href="mailto:rda.gippsland@rdv.vic.gov.au">rda.gippsland@rdv.vic.gov.au</a></td>
</tr>
<tr>
<td>Regional Development Victoria, Gippsland</td>
<td>A body of the state Dept of Business and Innovation</td>
<td></td>
<td><a href="mailto:information.traralgon@rdv.vic.gov.au">information.traralgon@rdv.vic.gov.au</a></td>
</tr>
<tr>
<td>South Eastern Councils Climate Change Alliance (\text{SECCA})</td>
<td>Reps of 8 councils including Bass Coast and Baw Baw shires.</td>
<td>A network of councils responding to climate change issues</td>
<td>Greg Hunt, <a href="mailto:ghunt@casey.vic.gov.au">ghunt@casey.vic.gov.au</a></td>
</tr>
</tbody>
</table>
Groups

Agribusiness Gippsland

*A peak body for the agriculture industry in Gippsland*

**Objectives:**
- To understand the region’s sustainable competitive advantage and current activity of major industries and enterprises
- To identify impediments for growth and formulate strategies to overcome these
- To achieve a critical mass
- To market the region as a place to do business and to invest.

**Activities:**
- Provides a forum for information exchange on the topic of agriculture in Gippsland (many of topics have theme related to sustainable practices)
- Organises events and workshops on a variety of topics
- *Produces a monthly newsletter, GippyAgchat, providing information on current agriculture related events and happenings in the region*

**Target audience:**
- All those involved in the agriculture industry in the region

**Personnel:**
- Has a nine-member board representing more than 2500 stakeholders

**Contacts:**
- Alex Arbuthnot AM, Chairman
- Susan Webster, Executive Officer

Clean Coal Victoria

*A program established by the Department of Primary Industry to develop ways of utilising Victoria’s coal resources at reduced carbon pollution levels*

**Objectives:**
- Clean Coal Victoria is a body set up with the aim of maximising the value of Victoria’s coal resources in order to best deliver the economic, social and environmental objectives for local communities and Victoria.

**Activities:**
- The principal functions of Clean Coal Victoria are strategic planning, regional environmental planning, research and investigation of the coal resource, and engaging with the industry, the community and other key stakeholders.
- *Note: “Clean coal” describes technologies, including carbon capture and storage, which remove, reduce or isolate the carbon pollutants associated with processing coal.*

**Target audience:**
- Power industry, relevant government departments and the community

**Contacts:**
- Charlie Speirs, Director, email: charlie.speirs@dpi.vic.gov.au
Committee for Gippsland

A recently instituted body to provide a voice for business in the Gippsland region.

Objectives:
- The Committee for Gippsland has been formed with the dual objectives of establishing a non-government, business funded organisation that represents the entire Gippsland region, while being able to identify and pursue opportunities that contribute to a strong and secure future for Gippsland.

Activities:
- Strategy currently under development.

Target audience:
- Businesses throughout Gippsland

Personnel:
- Has just appointed a board of local business representatives to establish the development of the Committee, along with an Executive Officer.

Contacts:
- Chairman: Harry Rijs, Patties Foods in Bairnsdale
- Executive Officer: Mary Aldred

DSE Climate Change & Sustainability Services

State Government Department operating numerous programs in response to climate change

Objectives
- To build the resilience, understanding and response of communities affected by the environmental impacts of climate change
- To build the capacity for people to integrate sustainability principles into their day to day business and activities
- To inform policy-makers on community issues and views through stakeholder management and intelligence gathering.

Activities:
- Future Coasts: see separate entry below
- Adaptation at Place: To develop and implement new place-based projects that facilitate and support local action to adapt to climate change impacts
- Victorian Local Sustainability Accord: Deliver and manage the Accord grants programs and broker relationships and knowledge that build the capacity of Victoria’s Local Governments to develop and implement sustainability and climate change programs.

Target Audience:
- The Local Government sector, through the resources and relationships provided by the Local Sustainability Accord; The natural resource management sector, through facilitating integration across the functions of DSE and other state and local government agencies at-place; DSE itself, to help meet the need to deliver sustainability managed natural resources that are resilient to a changing climate.

Personnel:
- Carole Macmillan, Ashley Hall, Tania Brooker, Angenita Hughes

Contacts:
- Tania Brooker, email: tania.brooker@dse.vic.gov.au
East Gippsland Catchment Management Authority

*The authority responsible for waterway and catchment management in the easternmost area of Victoria*

**Objectives:**
- The authority responsible for waterway and catchment management in the easternmost area of Victoria.

**Activities:**
- EGCMA is responsible for strategic and policy direction for the integrated management of land, biodiversity and water through East Gippsland
- The authority offers programs that engage with schools and the broader community, including *Landcare* and *Waterwatch*

**Target audience:**
- State and local government and business and communities in East Gippsland

**Personnel:**
- The EGCMA is directed by a skills based Board appointed by Government

**Contacts:**
- Email: egcma@egcma.com.au

Energy Innovation Cooperative

*A community group operating in southern Gippsland aimed at reducing the local community’s carbon footprint*

**Objectives:**
- To inform members and the broader community about renewable energy systems and the emerging renewable energy market
- To Facilitate the establishment of renewable energy systems with the objective of collectively selling surplus production into the energy market
- To promote a carbon neutral business ethic

**Activities:**
- Bulk purchases of solar panels for sale to the local community through Sustainability Victoria’s *Solar Hub* scheme
- Conducting community *Energy Saving Workshops* as part of Sustainability Victoria’s *Climate Communities* program
- Supporting local ‘Transition Towns’ groups

**Target audience:**
- Communities in the South Gippsland, Bass Coast and Cardinia shires

**Personnel:**
- The coop has a board of directors elected from its members
- Voluntary and paid staff manage its activities

**Contact:**
- Susan Davies susand@eico-op.com.au
- Website: [http://energycoop.ning.com/](http://energycoop.ning.com/)
**Gippsland Climate Change Network**

An organisation linking a wide range of groups responding to climate change across the region

**Objective:**
- To provide Gippsland, at an individual and organisational level, information, consultation and facilitation to enable action on climate change, whilst also providing a voice for Gippsland on climate change issues.

**Activities:**
- Informing: Delivering messages to a broad range of stakeholders on climate change in Gippsland
- Connecting: Identifying, supporting and coordinating actions that contribute to our mission
- Acting: Taking on a leadership role and managing selected projects that catalyse & measure progress towards our objectives
- Up to date activities can be viewed [here](#).

**Target audience:**
- The GCCN is a member-based not-for-profit organisation, with members from local, state and federal government departments and agencies, industry and industry groups, consultants, other not-for-profits, and concerned individuals.

**Personnel:**
- Board of Management plus Executive Officer

**Contacts:**
- Executive Officer, Scott Ferraro, scott.ferraro@epa.vic.gov.au
- Website: [http://www.gccn.org.au](http://www.gccn.org.au)

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**Gippsland Education for Sustainability Network**

A network for linking and developing sustainable education at all levels across Gippsland

**Objective:**
- To help prepare Gippsland for challenges ahead through improving the range and level of education about sustainability in the region.

**Activities:**
- Regular networking events to share information between practitioners and raise the awareness in the community about sustainable education in the region
- To support the development of a Regional Centre for Excellence within Gippsland under the UN Education for Sustainable Development program

**Target audience:**
- People involved with sustainability education at all levels of education in Gippsland

**Personnel:**
- Representatives from Monash Gippsland, TAFE colleges and the adult learning sector as well as all school systems in the region

**Contact:**
- Convenor, Barbara Johnson, email: argyle@wideband.net.au
**Gippsland Integrated Natural Resources Forum**

A forum that draws together all the region’s natural resource managers

**Objectives:**
- GINRF fosters strategic collaboration between natural resource managers in the Gippsland region, to achieve catchment health for Gippsland’s wealth.

**Activities:**
- Provides a forum/clearing house to share information about various aspects of managing Gippsland’s natural resources
- Produces an annual Report Card on the region’s natural resources.

**Target audience:**
- Gippsland natural resource managers and their programs

**Personnel:**
- Representatives of Federal and State Government agencies, 7 Local Government Authorities (including Cardinia), Regional Water Authorities, Not for Profit groups and Universities

**Contacts:**
- Executive Officer, Scott Ferraro, scott.ferraro@epa.vic.gov.au

**Gippsland Local Government Network**

An alliance of the six Local Government Authorities in Gippsland

**Objectives:**
- To act as a combined voice for Gippsland communities and address common areas of interest
- To develop positive relationships and encourage open dialogue with both state and federal governments
- To encourage community cohesion and economic growth
- To provide for future Gippsland communities by considering and adopting environmentally responsible and sustainable practices.

**Activities:**
- Undertook the development of the Gippsland Regional Plan (dealt with elsewhere in this document)
- Overseeing the University of Melbourne/ DPI study Gippsland Climate Change Impacts and Adaptation project (also dealt with elsewhere in this document)

**Target audience:**
- Local government and communities in the six council areas represented

**Personnel:**
- CEO’s of six Gippsland Councils (Bass Coast Shire Council, Baw Baw Shire Council, East Gippsland Shire Council, Latrobe City Council, South Gippsland Shire Council and Wellington Shire Council)

**Contact:**
Gippsland Regional Management Forum

A regional group aimed to facilitate collaboration between Victorian Government Departments and local government in Gippsland

**Objective:**
- The key role of the RMF is to identify and address critical social, economic and environmental issues facing the region.
- To encourage cooperation between departments and with councils; and
- To work with authorities, businesses and communities to set & deliver key priorities.

**Activities:**
- The RMF was involved in developing the Gippsland Regional Plan
- It has been involved with projects related to sustainable development, water use, improved transport access, integrated planning between levels of government and community engagement
- RMF members provide financial support and involvement of staff in the Gippsland Climate Change Network.

**Target audience:**
- State and local government departments and relevant members of the Gippsland community

**Personnel:**
- The forum consists of the regional directors (or equivalent) of state government departments and agencies, the CEOs of Gippsland’s six local government authorities, Monash University, Destination Gippsland and GINRF.

**Contact:**
- Kathleen Malone, Regional Executive Support Officer, Kathleen.malone@dpcd.vic.gov.au

Gippsland Regional Plan Working Groups

*A long term plan for the future of Gippsland*

**Objectives:**
- The Gippsland Regional Plan (GRP) 2010, is a long-term strategic plan that aims to manage the emerging challenges in the region to shape a successful future.
- The working groups have been established to oversee the development and delivery of the 10 identified priorities.

**Activities:**
- Two working groups relevant to climate change
  - Centre for Sustainable Technologies
  - Gippsland Low Carbon Economy Transition Plan

**Target Audience:**
- Gippsland community and government members and relevant state and federal government departments

**Personnel:**
- Members of the working groups include state & local government representatives.

**Contacts:**
- Gippsland Regional Plan Working Groups Coordination
  - Kathleen Malone, Kathleen.malone@dpcd.vic.gov.au
- Centre for Sustainable Technologies
  - Mark Sandeman, mark.sandeman@monash.edu
- Gippsland Low Carbon Economy Transition Plan
  - Allison Jones, Allison.Jones@latrobe.vic.gov.au
Gippsland Sustainable Agriculture Network

A group to promote sustainable regional agricultural production and land management

Objective:
- To give an opportunity for people to get together to share knowledge and align action for sustainable food and fibre production and land management in Gippsland

Activities:
- Runs a series of meetings and events to promote and demonstrate sustainable practices in agriculture

Target audience:
- Farmers, industry groups and those who work with farmers to help care for the land in Gippsland

Personnel/affiliated groups:
- The network is supported by funding from the Australian Government’s Department of Agriculture, Fisheries & Forestry

Contact:
- Coordinator, Nick Dudley, WGCMA, email: westgippy@wgcma.vic.gov.au

Gippsland Regional Waste Management Group

A statutory authority to advance reduction of waste and more efficient resource use

Objective:
- To support Member Councils and communities to initiate community projects that help reduce waste, prevent litter and enhance efficient resource use.

Activities:
- Delivers Sustainability Victoria’s Resource Smart Program
- Offers programs aimed at reducing waste in schools, homes and businesses.

Target audience:
- Member councils and all sections of the Gippsland community

Personnel:
- The Group operates under a Board of Management, the directors of which are nominated from each of the six Gippsland councils. The staff includes an Executive Officer, Education Officers and administrative support.

Contact:
- Matthew Peake, Executive Officer, email adminrwmg@dcsi.net.au
- Website: http://www.grwmg.vic.gov.au/
Low Carbon Emissions Future Transition Committee

A newly formed committee of Latrobe City to advocate for the community in relation to the transition to a low carbon future

Objective:
- To act as a conduit for the flow of information from key stakeholders to the Latrobe City Council on the low carbon emissions transition process
- To assist the council in implementing its low carbon emissions policy

Activities:
- To be determined

Target audience:
- Latrobe city council and community and relevant parts of the wider regional, state and federal communities

Personnel:
- The committee consists of representatives from Latrobe City council, the power generation, engineering, small business, manufacturing, education, forestry and agriculture sectors. It also includes unions and relevant state and commonwealth departments.

Contacts:
- Allison Jones General Manager Economic Sustainability, email allisonjo@latrobe.vic.gov.au.

Latrobe City Climate Change Consultative Committee

A committee to promote the activities of Latrobe City in addressing climate change

Objective:
- To act as an advocate and sounding board for the community and other stakeholders, bringing to the attention of council any issues of concern regarding the response to climate change

Activities:
- activities to support the advocacy and advisory role of the committee

Target audience:
- Latrobe City council and its community

Personnel:
- Councillors, and representatives from the community, education, industry, Gippsland Trades and Labour Council and state agencies

Contacts:
- Kevin Roberts, Sustainability Advisor, email kevinro@latrobe.vic.gov.au
- Website: http://www.latrobe.vic.gov.au/Environment/ClimateChangeConsultativeCommittee
Regional Development Australia, Gippsland

A federally sponsored group supporting the growth and development of Gippsland

Objective:
- to create a sustainable and economically confident Gippsland by 2020

Activities:
- RDA Gippsland is driving the implementation of the Gippsland Regional Plan in its alignment with the three levels of Government

Target audience:
- State and federal governments, regional development organisations, local businesses, community groups and key regional stakeholders

Personnel:
- RDA’s ten member committee consists of representatives of local councils, business, industry, education and community.

Contact:
- Dianne Carson, diane.carson@rdv.vic.gov.au

Regional Development Victoria, Gippsland

The Victorian Government’s lead development agency for Gippsland

Objective:
- To build stronger communities through employment, investment and infrastructure

Activities:
- Supports activities through the Regional Growth Fund
- Provides administrative and executive support to Regional Development Australia, Gippsland
- Funded ClimateWorks to undertake the Gippsland Low Carbon Growth Plan

Target audience:
- Communities throughout Gippsland

Personnel:
- 

Contact:
- information.traralgon@rdv.vic.gov.au
- Website: http://www.rdv.vic.gov.au/
South East Councils Climate Change Alliance (SECCCA)

A network of councils responding to climate change issues

Objective:
- To provide a regional response to climate change.

Activities:
- SECCCA carries out projects in greenhouse gas abatement, sequestration and adaptation on behalf of our Council members.

Target audience:
- Councils, community, industry and state and national government.

Personnel/ membership:
- Eight member councils in Melbourne’s south east including Bass Coast and Baw Baw shires.
- A management committee of representatives of these councils.

Contact:
- Greg Hunt, Executive Officer at: ghunt@casey.vic.gov.au
- Website: www.seccca.org.au

West Gippsland Catchment Management Authority

The authority responsible for waterway and catchment management in the western part of Gippsland

Objective:
- The West Gippsland Catchment Management Authority (WGCMA) is responsible for waterway and catchment management across the south-east corner of Victoria, Australia.

Activities:
- Undertakes environmental planning and on-ground works in consultation with stakeholders.
- Was involved with the Climate Change Impacts and Adaptations in Gippsland project, one of three regional pilot projects in Victoria which commenced in mid 2005. A summary of the project is available at: http://www.riversymposium.com/2006/index.php?element=06CAMINITIJoanne

Target audience:
- State and local government, businesses and communities in West Gippsland.

Personnel:
- The WGCMA is directed by a skills based Board appointed by Government and is responsible for strategic and policy direction for the integrated management of land, biodiversity and water through South, Central and West Gippsland.

Contact:
- Email: westgippy@wgmca.vic.gov.au
Projects Underway

Adaptation

Future Coasts

A program aimed at informing the community about the likely impacts of climate change on coastal areas

Objective:
- To help Victoria better understand and plan for the risks associated with climate change

Activities:
- The program provides detailed maps of the elevation of coastal areas along the Victorian coast including Gippsland as well as storm surge models for the area. Parallel to this work, DSE is working with the Department of Planning and Community Development to develop policy principles and adaptation tools. This data is the first step along the path of adaptation and can be used to inform and support future adaptation activities.

Organisations involved:
- Lead: Department of Sustainability & Environment
- Partners: Local government
- Funding/auspicing body: Department of Sustainability & Environment

Target audience:
- People and communities living in or connected with coastal areas of Gippsland and throughout Victoria

Local contact:
- Tania Brooker, email: tania.brooker@dse.vic.gov.au

East Gippsland Shire Inundation Management Project

A committee formed to advise on inundation management issues and solutions for the Gippsland Lakes communities

Objective:
- to provide Council with collaborative and well informed advice regarding inundation management issues and possible solutions for Gippsland Lakes communities.

Activities:
- Preparation of a Community Consultation Strategy
- Assisting in developing policies including those relating to:
  ▪ development or modification of infrastructure and public assets,
  ▪ emergency response management, and
  ▪ planning for appropriate land use and development;
- Making recommendations about policy approaches, tools or responses that may be applicable to other locations across the Victorian coast;

Organisations involved:
- Lead: East Gippsland Shire
- Steering Committee: RDV, DPCD, DSE, EGCMA, RDA, Property Council of Australia, and a representative from the Development Industry and Community.

Target audience:
- members of the East Gippsland coastal community

Contacts:
- Note: A presentation entitled Coastal Climate Change and Planning in East Gippsland can be downloaded from this website
Gippsland Climate Change Impacts and Adaptation project

A University of Melbourne/Department of Primary Industry study aimed at providing information and proposals to assist Gippsland region to respond to climate change

Objective:
- To develop a vision and feasible opportunities for Gippsland to adapt to climate change and other drivers of change and transform into a low carbon society and economy

Activities:
- The project will focus initially on agricultural issues but move onto factors related to the broader economic and social impacts of the changing climate on rural livelihoods.
- It is commencing with land-use suitability assessments for up to 12 agricultural commodities (including forestry) under various climate change scenarios and will systemically investigate the associated impacts, and adaptation options, for rural communities in Gippsland.

Organisations involved:
- Lead: Department of Primary Industry
- Partners: University of Melbourne; Hull Business School, University of Hull, UK
- Funding/auspicing body: The study is being auspiced by the Gippsland Local Government Network

Target audience:
- The target audience is agriculture and its associated industries and communities, as well as local government and other regional leaders.

Contacts:
- Dr Robert Faggian (DPI), email: robert.faggian@dpi.vic.gov.au

Social and Equity Dimensions of Climate Change Adaptation

Objective:
- Synthesise data on climate change risks in research areas
- Discover the adaptive capacity of the research locations including economic, social, technological, infrastructure and government resources that may assist adaptation
- Identify individual/collective values within the research locations in order to comprehend the impact specific adaptation options will have on the community.
- Develop practical adaptation options which will be ranked according to equity concerns
- Discover community understandings of the likelihood of equity in adaptation options

Activities:
- Year one – Interview relevant stakeholders; review socio economic trends in research areas; and review climate change predictions for region.
- Year two - survey 120 households in Lakes and 120 across the other three communities; identify local values, beliefs, and socio-economic indicators.
- Year three – Community consultation.

Organisations involved:
- Lead: Melbourne University
- Partners: DSE, DPCD, Wellington Shire, East Gippsland Shire and the Coastal Board
- Funding/auspicing body: Australian Research Council Linkage Grant

Target audience:
- Towns selected for this study include Lakes Entrance, Port Albert, Seaspray and Manns and McLoughlins Beach.

Local contact:
- Dr. Nick Osbaldiston, Melbourne University, no@unimelb.edu.au
Mitigation

Low Carbon Growth Plan for Gippsland

A detailed plan for reducing carbon emissions in Gippsland is being produced by ClimateWorks

Objective:
- To produce a plan aimed at reducing greenhouse gas emissions by 25 per cent by the year 2020 whilst also building a growing low-carbon economy. The plan will aim to identify a number of opportunities which use established technologies and which can be achieved at a moderated overall cost.

Activities:
- Estimate Business as Usual emissions
- Develop a cost curve & engage locally to refine curve with local data
- Identify barriers and tools to overcome to reduce emissions
- Develop action plan and engage stakeholders

Organisations involved:
- Lead: ClimateWorks Australia
- Funding/auspicing body: Funding provided through RDV, auspiced by Latrobe City Council

Target audience:
- Government, business, industry and community members in Gippsland

Contacts:
- Project director, Meg Argyriou, email: meg.argyriou@climateworks.org
Mapping education for sustainability initiatives in regional Gippsland schools and communities.

A Monash University project to map sustainability education in Gippsland

Objective:
- The aim of the project is to identify the location, nature and type of local place-based initiatives for sustainability in the Gippsland region.

Activities:
- Developing and conducting a survey of sustainability education in all schools community settings in Gippsland
- From this information exemplary programs will be selected for further study

Organisations involved:
- Lead: Monash University
- Funding/auspicing body: Monash University

Target audience:
- All schools and other settings providing education for sustainability in the region

Contact:
- Margaret Somerville, email: Margaret.somerville@monash.edu

ResourceSmartAussiVIC Pilot Project

A program supported by Sustainability Victoria to promote sustainability education in all schools in the region

Objective:
- To support teachers to deliver environmental sustainability education programs and provide an opportunity to share skills, knowledge and ideas.

Activities:
- Regular network meetings of teachers across the region
- Support for Sustainability Victoria’s various programs run under the Resource Smart Schools umbrella.

Organisations involved:
- Lead: Gippsland Regional Waste Management Group
- Partners: GCCN, DEECD and Catholic Diocese of Sale
- Funding/auspicing body: Sustainability Victoria

Target audience:
- Teachers and members of all school communities in Gippsland

Contacts:
- Program coordinator, Lisa Benn, email: avic@dcsi.net.au
Projects Proposed

**Centre for Sustainable Technologies**

* A research and educational centre based on Monash Gippsland together with regional partners

**Objective:**
- The Centre will focus on education, research and industry interaction to assist the transition to new technologies both now and well into the future.

**Activities:**
- Provision of education and training courses at Monash Gippsland and regional TAFE colleges
- Conducting research to develop technologies for the medium to longer term restructure of existing industries and the development of new opportunities
- Interaction with industry to match research to industry goals

**Organisations involved:**
- Lead: Monash University
- Partners: The centre will be a collaboration between Monash Gippsland and Gippsland regional stakeholders, including Industry, TAFE and Councils with the additional involvement of relevant outside expertise

**Target audience:**
- Regional industries interested in developing sustainable technologies and the personnel aiming to work in them

**Status:**
- Currently seeking funding

**Contacts:**
- Professor Mark Sandeman, email: mark.sandeman@monash.edu

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**Gippsland Communities Moving Towards Low Carbon Growth**

* A project focused on promoting & achieving energy efficiency and renewable energy generation within Gippsland

**Objective:**
- To encourage the take up of energy efficiency and renewable energy generation through the demonstration of application and benefits of these initiatives.
- Improve local government's operations
- To educate Gippsland's community and SME sector

**Activities:**
- Energy efficiency retrofitting of existing council facilitates
- Installation of distributed renewable energy generation
- Education and engagement program development and delivery

**Organisations involved:**
- Lead: GCCN & Baw Baw Shire Council
- Partners: 6 local government organisations within Gippsland

**Target audience:**
- Gippsland communities and SME sector

**Status:**
- Application submitted under Sustainability Accord, pending approval

**Contacts:**
- Scott Ferraro, scott.ferraro@epa.vic.gov.au
**Gippsland Transition Education Program**

*A program to develop the skills required in a future Gippsland low carbon economy*

**Objective:**
- To prepare the Gippsland community for a Just Transition to a low carbon economy

**Activities:**
- Establish what skills will be required in a future low carbon economy and where there will be shortages
- Develop educational and training programs to meet the shortages that become apparent

**Organisations involved:**
- Lead: Gippsland Trades & Labour Council
- Partners: VECCI/ Latrobe City/ Gippsland TAFE/ RMIT

**Target audience:**
- Regional educational institutions and employers and the personnel who will require new skills

**Status:**
- Awaiting funding approval

**Contacts:**
- John Parker, Secretary, Gippsland trades and labour Council, email: gtlc@wideband.net.au
Appendix II

Reference Committee

The project team established a reference committee for the project to ensure that the methodology is complementary to other related State and regional initiatives and that selected industry consultations are most appropriate. In particular, the reference committee also help to ensure that the findings inform the Victorian Government’s Skilling the Valley initiative. The information provided to the Reference Committee at the first meeting and the meeting minutes held on the 1st September 2011 in Traralgon, being the project brief, terms of reference, research methodology and minutes are attached in Appendix 1.

Those represented on the reference committee include:

Jason Van Ballegooyen (Commonwealth Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE), Industry Workforce Development Branch)
Marilyn Alborough (Regional Project Manager Latrobe Advantage Fund)
Kevin Slade (Gippsland Education Precinct)
Luke van der Meulen (Construction, Forestry, Mining and Energy Union)
Val Prokopiv (Gippsland Trades and Labour Council)
Kemal Sedick (Skills Victoria, “Skilling the Valley” Project Manager)
Allison Jones (Latrobe City Council - Low Carbon Future Transition)
Richard Elkington (Regional Development Australia)
**Appendix III**

**Stakeholders consulted and interview participants**

<table>
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<tr>
<th>Role</th>
<th>Organisation</th>
<th>Number interviewed/ consulted</th>
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<tr>
<td>Management Representatives</td>
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<td>9</td>
</tr>
<tr>
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<td>Continuous Presence and Independent Contractors</td>
<td>20</td>
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<tr>
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Appendix IV

INTERVIEW SCHEDULES

SCHEDULE 1: MANAGEMENT/HUMAN RELATIONS INTERVIEW/SURVEY

PART 1 THE INDUSTRY AND PRODUCTION

Q.1. What changes are likely to take place in the industry over the next five years?
   Probe: Ownership [state, municipal, national, international] implications for skills development

Q.2. How are these changes likely to impact on this company?

Q.3. What steps should the company take to address these changes?

PART 2 THE COMPANY - STRUCTURE

Q.1. What are the business activities covered by the company?

Q.2. How many people are employed at the company?

Q.3. Can you give me an indication of the broad occupational categories (definition) within the company and how many are employed in each category? (Begin with the manager/use the language of the country of origin)

Managers
Professional and technical (excl. managers)
Administrative/ Clerical
Trades (electricians, servicing, maintenance, distribution)
Trainees:
Graduate
Apprenticeships/traineeships
Other
Other occupations (please specify)

Q.5. What proportion of the workforce in this area of the company are:
   a) women?
   b) from ethnic categories (define)?

Q.6. What proportion of the workforce in division/company:
   a) are over fifty years old?
   b) are under thirty years old?
   Ask for more details

Q.7. What proportion of the workforce in your area are registered as disabled?

Q.8. What percentage of the workforce is:
   Permanent (No.s/ per cent)
   Fixed term
   Temporary
Labour Hire
Casual
Other (specify)

Q.8a  F-T P-T status? Nb what sort of change in f-t to p-t numbers over time – is p-t used in conjunction with traineeships/apprenticeships

Q.9.  What percentage of the workforce are under awards, enterprise agreements or individual contracts:
Awards
Enterprise agreements
Individual contracts

Q.10.  Have people been recruited over the last 12 months? In what occupational areas?

Q.11.  What change do you expect to see in employee numbers over the next 5 years? Distinguish by occupational category.

Q.12.  Is sub-contracting/out-sourcing a feature of the occupational profile. If so please provide details.

PART 3  SKILLS PROFILES & SKILL REQUIREMENTS

Q.1.  Would you please describe the skills profile of the company by broad occupational category.

Q.2.  Please give me an indication of the qualifications that are required of each of the broad occupational categories you have identified. (for example for a technician, an electrician)

Q.3.  Are you aware of any particular difficulties in attracting people with the right skills into the industry (refers to skill deficiencies)?

Q.4.  Have the skills required changed over the last five years (refers to skill needs)?

Q.5.  What changes in skills requirements (if any) are likely to occur over the next five years?

Q.6.  How are these requirements likely to be met over the next five years?

Q.7.  Do you experience any problems in recruiting for particular occupational categories in the company (eg. by qualifications)?

Q.8.  Are there specific qualifications, which your company is lacking? For each gap, is that gap having or is likely to have a significant impact on your business with specific examples.
Q.9. Are there other sets of more general skills that you require of your employees? (for example team working, communication skills, time keeping etc)? For which occupational categories are these skills required?

Q.10. Does the age profile of your current workforce matter?

PART 4  TRAINING

Q.1. Does the company see a benefit in training for its workers? If so what are those benefits and if not what are the disincentives?

Q.1a. What training is offered by the company? On average how many hours per month is allocated to training?

Q.2. Are employees in the company/plant funded to do discrete BLOCKS of training? (That is, a whole training course or package that is delivered in a single, uninterrupted block of one week or more).

2a. What types of training would be done in this way? Can you give me some examples and indicate the length of training? (Refer to on-line or face-to-face or both)

2b. For which occupational categories is this type of training?

2c. Where does this type of training usually take place?

2d. Is the training delivered by company trainers or outsourced to another provider, like a college or industry association?

2e. Is the training done in work time?

Q.3. Does the company fund and organise day release training for any of the employees?

3a. What types of training would be done in this way? Can you give me some examples and indicate the length of training?

3b. For which occupational categories is this type of training?

3c. Where does this type of training usually take place?

3d. Is the training delivered by the company’s own trainers or outsourced to another provider, like a college or industry association?

3e. Is the training done in work time?

Q.4. Do any of the employees do on the job training?

4a. What types of training would be done in this way? Can you give me some examples and indicate the length of training?

4b. For which occupational categories is this type of training?

4c. Is the training delivered by the company’s own trainers or outsourced to another provider, like a college or industry association?

Q.5. Do any of the training programmes that the company funds and organises, lead to a nationally recognised qualification? Please give me some examples.
Q.6. Are individuals limited in any way to the amount and type of training that they do? For example, are individual employees allowed a certain amount of hours per year or a certain amount of funding each year?

Q.7. Can you give me a copy of your training plans and training schedule?

Q.8. Are there any financial (or other) incentives for employees to enrol on training programmes?

**PART 5  FUTURE DEVELOPMENTS**

Q.1. Is it possible that the changes that are occurring in the sector, will lead to changes in the occupational categories that we have been discussing over the next five years? ten years? In what ways?

Q.2. Will these changes alter your skills profile? (for example, will you need more or less multi, semi, unskilled workers?)

Q.3. Are the credential/qualification requirements likely to change over the next five years? In what ways?

Q.4. Is it likely that you will have more or less need for people with other generic skills over the next five years? Can you give me an example?

Q.5. Do you think that changes in the industry over the next five years will have an impact on the nature of your workforce? For example:

5a. Will changes in the production process affect the gender, age, disability and ethnic background profile of your workforce?

5b. Will changes in the organisation of work affect the gender, age, disability and ethnic background profile of your workforce?

5c. Will changes in the credential and skill requirements affect the gender, age, disability and ethnic profile of your workforce?

5d. Will the aging of the workforce affect the profile of your workplace?

Q.6. Do you think the company will have to change the nature of its training strategies over the next five years in order to meet the demands of the changing sector? In what ways do you think your training strategies would need to change in order to meet the needs of:

6a. Existing employees and their development

6b. Future employees (apprenticeships, traineeships, graduates)

Q.7. Do you think that the mode of training will need to be changed or is likely to change? (For example from trainer/group to on-line learning). Why?

Q.8. Do you think that outside agencies like schools, colleges, TAFE, universities and other training providers are equipping individuals with the skills and qualifications that are required by the sector?

Q.9. What could outside agencies do in order to help you meet the demands of the sector more effectively in terms of:

9a. re-skilling and up-skilling existing employees

9b. training and qualifying future employees
Q.10. Is there anything that the state could or should do to assist training needs?
Q.11. What is the major difficulty that your company is likely to face over the next five /ten years in realising its skills requirements?
Q.12. Is the company likely to meet its skill requirements over the next five/ten years?
Q.13. Is there anything else that you would like to add?

THANK YOU
SCHEDULE 2: UNION INTERVIEW

PART 1 UNION

Q.1. What kinds of workers (occupational position) do you represent?

Q.2. How many members do you represent in the industry?

Q.3. Does the union have any particular responsibility for education and training?

Q.4. How does the union deal with questions relating to education and training within the industry?

Q.5. What steps can the union take to address changes which might take place in the industry?

PART 2 THE INDUSTRY AND PRODUCTION

Q.1. What changes are likely to take place in the industry over the next five/ten years?

Q.2. How are these changes likely to impact on this industry?

Q.3. What steps should the industry take to address these changes?

PART 3 SKILLS PROFILES AND SKILL REQUIREMENTS

Q.1. Have the skills required by the industry changed over the last five years?

Q.2. How are these requirements likely to be met over the next five/ten years? (Probe)

Q.3. What changes in skills requirements are likely to occur over the next five/ten years? (Probe)

Q.4. Have there been any problems in recruiting for particular occupational categories within the industry?

Q.5. Have people been recruited over the last 12 months? In what occupational areas?

Q.6. What change do you expect to see in employee numbers over the next five/ten years? Distinguish by occupational category.

Q.7. Are there specific qualifications, which your industry is lacking? For each gap, is that gap having or is likely to have a significant impact on the industry with specific examples.

PART 4 TRAINING

Q.1. How would you describe the training by the industry available to your members in the industry?
Q.2. What modes of training are available for your members/ (eg. On-site training, Day release, Block release and so forth)?

Q.3. Are you aware of any particular difficulties in attracting people with the right skills and qualifications into the industry?

Q.4. Are you aware of any problems in the industry in relation to skills training and re-training (e.g. Number of programmes available)? Please give me some examples.

Q.5. Are there particular issues that come up relating to disability, gender, age or ethnicity and skills and training? If so, please explain with examples and dates.

Q.6. Do you have particular policies regarding these issues? If so, how were these policies developed? Who was involved and when? Is it possible to have copies of any policies you have?

Q.7. What, if any, have been the main successes for your union in the industry in relation to skills and training over the last five years?

Q.8. Have you experienced any particular difficulties in relation to the issues of skills and training over the last five years? If so, please explain with examples and dates.

Q.9. What do you think will be the training requirements for power industry workers for the next five/ten years? How should this training be delivered?

Q.10. What types of training might be needed in a “Just Transition” from coal to a clean energy future?

Q.10. Should the employer offer incentives (financial or otherwise) for employees to enrol on training schemes? If so, what should they be?

Q.12. Does the Union have any view about provisions for the proportion of trainees/apprentices to skilled workers?
SCHEDULE 3: EMPLOYEE INTERVIEW

PART 1 WORKFORCE

Q.1. Please give me a skills profile of the workforce (for example what proportion of your workforce are skilled, multi-skilled, semi-skilled and unskilled)?

Q.2. Please give me an indication of the qualifications that are required of each of the broad occupational categories you have identified. (for example for a technician, a team leader, a team member)

Q.3. Are there sets of more generic skills that you require of your employees? (for example team working, communication skills, time keeping etc)? For which occupational categories are these generic skills required?

Q.4. Has the skills profile changed over the last five years and in what ways?

Q.5. Describe any changes that have taken place in the organisation of work over the last five years, and what implications this may have for skills required.

PART 2 SKILLS PROFILE AND REQUIREMENTS

Q.1. How important are qualifications for jobs in the company? (Examples)

Q.2. Are qualifications an outcome of promotion and/or a condition for promotion?

Q.3. In the light of the changes, which are occurring in the sector, what are the skills (and qualifications) requirements likely to be over the next 5/10 years?

Q.4. What, if any, is the relationship between qualifications and jobs in this company/industry?

Q.5. Do you feel that your current skills would help you find work in other industries/sectors?

Q.6. Is there a particular industry sector which attracts you other than the power industry for future job opportunities? (Ie agriculture, forestry, food processing, tourism, own business, other?)

PART 3 TRAINING

Q.1 Do you benefit from participating in training? If so why/why not?
   1a. What training takes place in the plant and how is it done? Can you give some examples of training you have undertaken?
   Q.2. Who normally conducts this training? (Can you give some examples)

Q.3. Is there an opportunity to do training off-site? If so, where, with whom? Have any of you taken part in this type of training (examples)

Q.4. Is it difficult/easy to get on training courses? What are the procedures? Who decides?
Q.5. Are you satisfied with the training that you have received since you began work here? Why? Why not?

Q.6. Is there any other training that you think would be useful to you in your current jobs? What is this training? How could it be delivered? Why is it important?

Q.7. What changes are beginning to happen in your areas of work, which may affect your training needs?

Q.8. Is the union involved in assisting you with your training and educational requirements? Please give examples.

Q.9. By what mode would you prefer this training to be provided?
   9a. Away from work at a college?
   9b. At the workplace through on-line programmes in the open learning centre?
   9c. On-the-job training
   9d. By any other mode?

Q.10. What type of training would help you develop skills that are recognised by other employers?

PART 4  FUTURE DEVELOPMENTS

Q.1. Is it possible that the changes, which are occurring in the sector, will lead to changes in the occupational categories in the company? What kinds of jobs will there be?

1a. What do you think are the likely changes in the power industry over the next 5/10 years?

Q.2. Will these changes alter the skills profile in the company? (for example, will you need more or less multi, semi, unskilled workers?)

Q.3. Are the credential/qualification requirements of the company likely to change? In what ways?

Q.4. Is it likely that you will have more or less need for people with other generic skills? Can you give me an example?

Q.5. Do you think that changes in the industry will have an impact on the nature of the workforce?

For example:

5a. Will changes in the production process affect the gender, age, disability and ethnic background profile of the workforce?
5b. Will changes in the organisation of work affect the gender, age, disability and ethnic background profile of the workforce?
5c. Will changes in the credential and skill requirements affect the gender, age, disability and ethnic profile of the workforce?
Q.6. Do you think the company will have to change the nature of their training strategies in order to meet the demands of the changing sector? In what ways do you think the training strategies would need to change in order to meet the needs of:

6a. existing employees and their development
6b. future employees (apprenticeships, graduates)

Q.7. Are there any other points that you would like to make?

**PART 5  CAREER INTERESTS AND ASPIRATIONS**

Q.1 What are you career intentions over the next 5 years (e.g. retire, remain in the current job, move into a new area of work, enrol in a new TAFE or university course)?

Q.2 What are your long-term career aspirations?

Q.3 How do you think you can achieve those career aspirations?

Q.4. Do you think you can achieve these aspirations living in the Latrobe Valley?

Q.5. What type of support do you need to assist you in achieving these career aspirations?

Q.6 Are you the primary wage earner in your household?

Q.7. Will your decisions about your future career opportunities be influenced by your relationships with other members of your household?