Identification of opportunities to support structural adjustment in the Latrobe Valley region

Final report

Prepared by
Professor Peter Fairbrother
Dr Darryn Snell
Professor George Cairns
Dr Larissa Bambery
Dr Meagan Tyler
Ms Madeleine Pape
Mr Claude Rioux
Mr Sam Carroll-Bell
Ms Silvia Suraci
About this report

In January 2012, the Commonwealth Department of Regional Australia, Local Government, Arts and Sport (DRALGAS) commissioned the Centre for Sustainable Organisations and Work (based at RMIT University) to examine opportunities for investment and job growth in the Latrobe Valley. This report outlines the key findings, priorities and considerations of this study.

This report has been prepared by

Professor Peter Fairbrother
Director
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 5105
Email: peter.fairbrother@rmit.edu.au

Ms Madeleine Pape
Researcher
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 5940
Email: madeleine.pape@rmit.edu.au

Dr Darryn Snell
Senior Researcher
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 1426
Email: darryn.snell@rmit.edu.au

Mr Claude Rioux Associate
Researcher Interuniversity
Research Centre on Globalization and Work (CRIMT) University of
Montreal, Canada Email: cl.rioux@sympatico.ca

Professor George Cairns
Research Professor and Head of School
School of Management
RMIT University
Phone: +61 3 9925 5602
Email: george.cairns@rmit.edu.au

Mr Sam Carroll-Bell
Research Co-ordinator
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 5940
Email: sam.carroll-bell@rmit.edu.au

Dr Larissa Bamberry
Researcher
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 1455
Email: larissa.bamberry@rmit.edu.au

Ms Silvia Suraci
Research Assistant
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 5623
Email: silvia.suraci@rmit.edu.au

Dr Meagan Tyler
Researcher
Centre for Sustainable Organisations and Work
RMIT University
Phone: +61 3 9925 5940
Email: meagan.tyler@rmit.edu.au
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Final report

Prepared by

The Centre for Sustainable Organisations and Work (RMIT University)

Prepared for

Commonwealth Department of Regional Australia, Local Government, Arts and Sport

May 2012
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<th>Full Form</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<tr>
<td>ACCC</td>
<td>Australian Competition and Consumer Commission</td>
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<td>ASHE</td>
<td>Annual Survey of Hours and Earnings, UK</td>
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<td>APEL</td>
<td>Australian Power and Energy Limited</td>
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<td>C4G</td>
<td>Committee for Gippsland</td>
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<td>CCS</td>
<td>Carbon Capture and Storage</td>
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<td>CCT</td>
<td>Clean Coal Technologies</td>
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<td>CEF</td>
<td>Clean Energy Future</td>
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<td>CFC</td>
<td>Contract for closure</td>
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<td>CIAB</td>
<td>Coal Industry Advisory Board</td>
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<td>CLT</td>
<td>Cross-laminated timber</td>
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<td>CPC</td>
<td>Continuous-presence contractors</td>
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<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>CRIMT</td>
<td>Interuniversity Research Centre on Globalization and Work</td>
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<tr>
<td>DEEWR</td>
<td>Department of Employment, Education and Workplace Relations</td>
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<td>DPCD</td>
<td>Department of Planning and Community Development</td>
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<td>DPI</td>
<td>Victorian Department of Primary Industries</td>
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<td>ECT</td>
<td>Environmental clean technologies</td>
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<td>EOI</td>
<td>Expression of interest</td>
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<td>FIFO</td>
<td>Fly-in fly-out</td>
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<td>FPI</td>
<td>Forest products industry</td>
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<td>GEAC</td>
<td>Great Energy Alliance Corporation</td>
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<td>GFC</td>
<td>Global financial crisis</td>
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<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>GILUP</td>
<td>Gippsland Integrated Land Use Plan</td>
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<td>GLGN</td>
<td>Gippsland Local Government Network</td>
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<td>HR</td>
<td>Human resources</td>
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<td>HVP</td>
<td>Hancock Victoria Plantations</td>
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<td>IEA</td>
<td>International Energy Agency</td>
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<td>IT</td>
<td>Information technology</td>
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<td>LGA</td>
<td>Local government area</td>
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<td>LNG</td>
<td>Liquid natural gas</td>
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<td>MID</td>
<td>Macalister Irrigation District</td>
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<td>MW</td>
<td>Megawatts</td>
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<td>NCC</td>
<td>Nanocrystalline cellulose</td>
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<td>NGO</td>
<td>Non-governmental organisation</td>
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<td>OSB</td>
<td>Oriented-strand board</td>
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<tr>
<td>PESTEL</td>
<td>Political, economic, social, technological, ecological and legal factors</td>
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<tr>
<td>RAAF</td>
<td>Royal Australian Air Force</td>
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<td>RPL</td>
<td>Recognition of Prior Learning</td>
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<td>SECV</td>
<td>State Electricity Commission of Victoria</td>
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<td>SEFE</td>
<td>South East Fibre Exports</td>
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<td>SME</td>
<td>Small and medium enterprises</td>
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<tr>
<td>TEPCO</td>
<td>Tokyo Electricity and Power Company</td>
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<tr>
<td>UHT</td>
<td>Ultra-high temperature</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>USDE</td>
<td>United States Department of Energy</td>
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VET  Vocational education and training
WA   Western Australia
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Text Box 3.3 Covino Farms
Text Box 3.4 Flavorite Tomatoes
Text Box 3.5 Murray Goulburn Co-op
Text Box 3.6 East Gippsland Food Cluster
Text Box 3.7 Burra Foods Australia
Text Box 4.1 GippsAero
The research team

The research has been undertaken by a research team based in the Centre for Sustainable Organisations and Work, RMIT University. The team comprises:

Professor Peter Fairbrother  Dr Darryn Snell
Professor George Cairns  Dr Larissa Bambery
Dr Meagan Tyler  Ms Madeleine Pape
Mr Sam Carroll-Bell  Ms Silvia Suraci

As part of the project, the Centre commissioned Mr Claude Rioux from the Interuniversity Research Centre on Globalization and Work (CRIMT), University of Montreal, Canada, to provide expert guidance in relation to forestry, paper and timber.

The Centre for Sustainable Organisations and Work

Established in 2009, the Centre for Sustainable Organisations and Work promotes theoretically informed analyses across a wide array of social science disciplines. Unified by a common exploration of the concept of sustainability, Centre staff develop evidenced-based theories and applied analyses of the contemporary social world. The aim is to inform and promote effective policy, practice and debate. A major strand of this work focuses on the Asia-Pacific region. Another examines the social changes and impacts of transition to a low-carbon economy. To that end the work of the Centre is focused on developing an understanding of people in the context of significant social, economic and organisational change.

In order to build concentrations of expertise, the Centre is structured around a series of research clusters. This structure enables the Centre to produce high-quality research outputs as well as to develop strong collaborative links with other research centres.

RMIT disclaimer

While the Centre for Sustainable Organisations and Work endeavours to provide reliable analysis and believes the material presented to be accurate, it will not be liable for any claim by any party acting on such information.

Commonwealth of Australia disclaimer

This report has been prepared to inform future policy analysis and does not represent the views of the Commonwealth
Executive summary

Map ES.1: Gippsland provincial region

1. The project aims to analyse the current economic and labour situation, as well as to consider the future economic and labour possibilities for the Latrobe Valley region. It identifies the opportunities and barriers to economic revitalisation, and proposes the key considerations and priorities for the future of the region and Gippsland as a whole.

2. The Latrobe Valley region comprises three local government areas (LGAs): Baw Baw, Latrobe City and Wellington. The area of Gippsland also includes the LGAs of East Gippsland, South Gippsland and Bass Coast.

3. The prosperity and future of the Latrobe Valley region (and Gippsland) depends largely on its natural resources. Thus, an understanding of both the resources (strengths and limitations of each resource) and their value-adding potential is vital.

4. The project adopts a resource and organisational approach to investigate the economic prospects of the Latrobe Valley region by considering the following resource sectors:
a. coal (and electricity)
b. oil and gas
c. forestry (paper and timber)
d. agriculture (agrifood/agribusiness).

Each of these sectors is strategically important to the region’s economic output.

5. Each sector has been shaped by dominant organisational networks and companies. These relationships change over time and operate in many cases as ‘flexible organisational networks’ – lead firms and layered suppliers, contractors and associated organisations providing goods, services and maintenance.

6. These four sectors are interconnected in a number of ways. Each competes for labour, land and water resources and relies on transportation infrastructure as well as markets located outside the region.

7. Trends in the four resourced-based sectors also affect the broader, multi-sector industries of construction and manufacturing. Having the capacity to deliver construction underpins how and/or if future investment into the four resource-based sectors takes place.
Opportunities, barriers and priorities for the four sectors

The four sectors face particular issues in relation to the opportunities and barriers to their future development.

Coal

Opportunities

- Clean coal technologies: These technologies range from upgrading and improving existing coal-fired electricity plants to so-called ‘near-zero’ emissions technologies such as carbon capture and storage (CCS).
- Diversification: The prospects for diversification are extensive, e.g. coal to fertiliser, coal to liquid, coal to gas.
- Export: Technological advances in drying, de-watering and stabilising brown coal have contributed to a renewed interest in processing the coal ready for transportation for export.
- Transition to an energy hub: Currently the region is primarily a coal resource hub comprising the resource itself, a skilled workforce, grid infrastructure and land. The region is therefore well positioned to be developed into an energy hub, with coal as one (declining) energy resource, characterised by incremental substitution of alternative energy resources. These alternative resources could include gas-fired power stations and renewable and recycling energy facilities.

Barriers

- Transport infrastructure: Export arrangements for coal depend upon effective transport arrangements including port facilities, most of which are not in place and will take a number of years to develop. The result may be developmental dislocation – without coal export, it is unlikely that road-rail-port upgrades will occur; without transport upgrades there can only be limited coal export.
- Feasibility of new technologies: Many technologies for clean coal and related developments are in the process of being developed and
evaluated, although there is little evidence that they will come to fruition as commercial facilities in the short term.

- Environmental concerns: The social licence for the use of coal for generating electricity is limited and likely to be further reduced over the next few years. Unless there are significant advances in clean coal technology, the export of brown coal is also likely to confront significant opposition from environmental organisations.

- Political uncertainty and inaction: Uncertainty surrounding energy policy and the treatment of carbon emissions as a result of the ongoing political debate between the major political parties and state and federal government continues to constrain investment and clean energy technology decisions.

**Priorities**

| Priority one: | The business case for the export of coal (lignite) should be developed. While led by private interests, it should, however, be subject to the condition that any export of lignite should have a threshold standard that is equal to gas emissions, for CO₂ pollution reasons as well as for the integrity of the business case. |
|-------------------------------------------------|
| Priority two: | There are distinct possibilities for the alternative uses of coal (lignite). Major businesses, including the generator and mine owners should be encouraged to take focused, small steps, to re-engineer current practices as well as develop new products. These measures should involve deliberate experimentation and the promotion of small-scale commercial trials. |
| Priority three: | Continue to promote the Latrobe Valley region as an energy hub by enlisting government support at the state and federal level to locate alternative electricity generation technologies and facilities in the region. |
Oil and gas

Opportunities

- Increasing demand: With the shift away from coal use in electricity production, gas-fired generators are now being built and commissioned. There is also an increasing use of gas industrially and domestically, as well as a continuing and growing demand for oil. Strong demand for natural gas and natural-gas derived products is expected under carbon pricing, which is helping to underpin investor interest in these sorts of projects.

- Similar skill sets for displaced workers from coal and electricity: Already there is evidence that many workers who have lost their jobs in the power generation sector have been able to secure employment with the major contract companies that service the oil and gas sector, although prospects for jobs growth are limited.

- Construction of new projects in the Gippsland Basin: There are limited opportunities to continue the development of the oil fields and associated facilities, creating potential work for specialised and highly skilled labour in the construction and maintenance field. Contract and labour-hire firms are responsible for the bulk of employment in this area.

Barriers

- Low prospects for job growth: The oil and gas industry is capital intensive, with limited prospects to increase the workforce, unless linked to employment in construction and maintenance.

- The end of locally based construction by the major company: The lead company appears less inclined to carry out major platform construction work locally as has been the previous practice. Increasingly, it commissions companies interstate and overseas to construct various components for offshore platforms, with installation becoming the major activity to occur in the region. Thus, a corporate decision limits job opportunities for the regional workforce within the sector.

- Maturity of the fields in the Gippsland Basin (declining reserves in the medium term, despite current expansion): The issue of declining reserves exacerbates the issue of the high-risk nature of investment in the sector.
Priorities

**Priority one:** Establish targeted worker-transition assistance packages for displaced power generation workers to acquire work in the oil and gas industry.

**Priority two:** Maintain the Latrobe Valley as an energy hub by commissioning and locating all future gas-fired power stations within the Latrobe Valley region.

**Priority three:** Open up access to the natural gas infrastructure across the Latrobe Valley region.

**Priority four:** Develop key implementation strategies for natural gas utilisation as part of the rollout of the Clean Energy Future legislation and the transition to a low-carbon economy.

Forestry, timber and paper

**Opportunities**

- **Expansion and diversification:** The Latrobe Valley region is already home to a network of key businesses in forestry, paper and timber that are well established and either considering or, under the appropriate circumstances, would consider expansion and diversification within the region.

- **Improvements to value-adding through new technology:** Internationally significant amounts of investment have been committed to research and development into technologies to produce high-value wood-derived products, with the prospect of access to new markets.

- **Bioenergy/biomass for fuel and energy production:** The bioenergy potential of the Latrobe Valley region is well established. The region’s forestry, timber and paper industries are a major potential source of fuel for commercially viable bioenergy generator(s) and related biofuel innovations.

- **Recycling material to form new products:** Different types of industrial or domestic residues and by-products are also considered a potential source of fuel/fibre for bioenergy generation and other uses. Projects of this nature have the potential to improve economic linkages between metropolitan Melbourne and Gippsland.
Barriers

- Supply limitations: The Latrobe Valley region’s forest and plantation resources are limited and declining, further undermined by problems of capital and land availability.

- Limited prospects for capital investment: The investment climate does not provide the level of stability required for long-term resource security. This partially stems from changes in licencing arrangements and logging quotas, which may or may not be influenced by environmental concerns and opposition. The problem is not demand but supply and the conditions that would secure investment in relation to supply. While there is a relationship between investment and demand, in the face of declining supply, purchasers of timber and related products have little choice but to look elsewhere for these goods.

- Diminishing social licence: The politicisation of the sector and its industries is severely handicapping the sector in terms of government willingness to support its expansion, not only in relation to increasing the fibre source but also in terms of developing its biofuel potential.

- Ownership and acquisition: In an industry characterised by a few large employers the issue of ownership is critical. It affects the flow of investment into the sector, continued operation of specific plants, and the willingness to expand their product base.

- Narrow industry base: Ownership patterns limit the access of non–industry specific enterprises, such as bio-facility operators, into the sector. Complementing this feature is the way resources are locked into a particular production chain by time-specific contracts.

Priorities

| Priority one: | Develop a plan that identifies the forest resource for the area and sets out the parameters for the sustainable use and replenishment of the resource. |
| Priority two: | Develop a supported program to establish at least one biomass facility in the region, one that can use forest waste (at least from plantations), metropolitan timber waste and agricultural waste. |
| Priority three: | With timber manufacturers, the Victorian Government should promote feasibility studies for a program of |
investment for further value-added timber production in the region, either through or associated with the existing timber facilities.

**Priority four:** With other sectors, attention should be given to promotion and support of focused research and development programs that build on sector-based research capacities for the region as a whole.

### Agriculture and agribusiness

**Opportunities**

- Establishing food and/or dairy processing clusters: The cluster concept is based on the East Gippsland Food Growing and Processing Cluster, which is considered to demonstrate the way forward for the agribusiness sector in Gippsland. This cluster has been successful in attracting and retaining food processors in the East Gippsland region, and in improving the connection between local farmers and these processors. The success is largely attributed to its collaborative approach and organisational structure. There is potential for a similar cluster in dairy or food production in the Latrobe Valley region, given the proximity and concentration of primary producers across Gippsland.

- Diversifying existing operations: The food and dairy processing industries have the potential to diversify through technological innovation, product diversification and opening up new and sometimes niche markets (e.g. organic foods).

- Using new farming techniques and technologies: The Latrobe Valley region is at the centre of a major agricultural hub that includes dairy and beef, vegetables and viticulture. There are opportunities for the sector to extend its activity and increase its workforce. Expansion of the hydroponic industry in Baw Baw Shire and intensification within the Macalister Irrigation District may increase the availability of locally grown local produce for processing.

**Barriers**

- Land access and usage: Competition in relation to land use is creating problems for agriculture. There is particular concern surrounding the
absence of adequate planning laws to protect the region’s prime agricultural land.

- **Water access and usage:** Water is critical for the ‘intensification’ of agriculture. It sets a limit to growth in primary production, in broadacre and dairy farming as well as in horticulture and cropping. At present, agribusiness in the Latrobe Valley region is essentially at capacity in terms of what can be produced from the water available.

- **Labour shortages:** Agriculture faces ongoing labour shortages in a range of areas including relief work, seasonal work and specialist technical staff.

- **Entry into the sector,** particularly in relation to dairy and broadacre farming, is becoming more difficult due to increased capital costs (including land), declining profit margins and negative perceptions about farming as a career path.

- **Transport infrastructure:** At present, food processors in the region are reliant on roads to transport their products for domestic consumption and export, with a major destination for companies being the Port of Melbourne. There appears to be a very mixed, overlapping and inefficient set of arrangements in relation to supply and exit of products into, out of and across the region, particularly in dairy processing but also in other areas.

**Priorities**

<table>
<thead>
<tr>
<th>Priority one:</th>
<th>The skills and labour shortages that mark this sector require consideration of comprehensive outreach work to support the ageing workforce, facilitate generational change and encourage entry into the sector.</th>
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<td><strong>Priority two:</strong></td>
<td>Develop a plan that identities the agricultural resource for the area and sets out the parameters for the sustainable use and protection of the resource.</td>
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<tr>
<td><strong>Priority three:</strong></td>
<td>The farming industry is increasingly moving towards an intensification of mechanisation and equipment use, via technical development and economies of scale. There are, however, major deficits in relation to technical support, installation, maintenance and repair of such technology. Governments, and particularly the Commonwealth, should take steps to ensure that technical support and capacities are readily available to farmers and to the organisations servicing the sector.</td>
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<tr>
<td><strong>Priority four:</strong></td>
<td>Develop a cooperative plan in relation to collection,</td>
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storage and distribution of farm products, particularly in the dairy industry but also taking into account the requirements of other subsectors. This plan should include steps to develop the transport and logistics infrastructure projects that are critical to the future of Gippsland.

**Priority five:** State and federal governments should review and systematically promote the use of biomass and recycling facilities across the region in line with the National Renewable Energy Target Scheme.

**Priority six:** The appropriate government should provide support – through expert advice, links, finance – to local government to promote the Latrobe Valley region as a ‘Food Hub’.
General considerations and priorities

Considerations across the sectors

The report draws out a range of issues and considerations that are relevant to all four sectors. These priorities are a summation of the sector priorities and hence are presented in a more direct way. Some of the general considerations that apply to all sectors are:

**Consideration one:** Improving infrastructure that meets resource-based industry needs

Infrastructure upgrades and development (including intermodal hubs) are a critical precondition for continued growth in the Latrobe Valley region. Without an integrated, comprehensive and multisector infrastructure program, it is unlikely that the region will be able to engage in effective structural adjustment. Promoting and developing such steps and formulating programs are the responsibility of the state and federal governments working in conjunction with LGAs.

**Priority one:** Commission the formulation and presentation of an integrated, public and costed infrastructure program (i.e. communications, transport, business and economic services) detailing required investment across the entire region.

**Priority two:** As a matter of urgency, all levels of government should cooperate to develop and publicise the business case for transport alternatives.

**Consideration two:** Support for value-adding and diversification in the use and processing of resources within the region

While there may be uncertainty about the future within and across the resource sectors, viable value-adding opportunities continue to be largely underdeveloped. A number of companies, however, are confronting significant market changes and have taken steps to strengthen their business through diversification. Targeted business assistance for these companies as part of the
contract-of-closure process is important to minimise job losses and expand the value-adding activity in the region. Of note, this assistance should go beyond the assistance provided when there is market failure; after all, it is amply demonstrated with reference to Australian industry, as well as internationally, that anticipation usually provides more satisfactory and equitable outcomes in relation to regions undergoing hardship.

**Priority one:** A more comprehensive and strategic approach is needed to capture appropriate (economic, environment and social) investment opportunities.

**Priority two:** Establish an integrated and coherent investment strategy and policy for Gippsland as a whole, initially under the auspices of the Latrobe Valley Transition Committee.

**Priority three:** Continue to support the Latrobe Valley region as Victoria’s energy region, particularly through the diversification of energy sources and technologies to incorporate biofuel and renewables.

**Priority four:** Develop more integrated ways to facilitate inward investment and company relocation.

**Priority five:** Commission and fund a time-specific job creation and industry development approach to value-adding within and between the resource sectors in the region.

**Consideration three:** Presenting a revitalised Latrobe Valley region (and Gippsland)

The dominant perception of the Latrobe Valley is as an old industrial region, an area of smoke stacks and ‘militant’ industrial workers. In this view other sectors, such as forestry and agriculture, are often overlooked when considering the economy. Such imagery is often drawn upon to explain and justify a lack of inward investment.

**Priority one:** The major industrial associations for employers and unions in the region should be encouraged to sign a renewed memorandum of understanding committed to the principles and practices exemplified by the Latrobe Valley Transition Committee (a classic tripartite committee).
Considerations for Gippsland

Addressing the specific and general issues impacting upon the four sectors cannot be achieved without due consideration and attention to the context in which these sectors operate and are situated. The following considerations are of considerable concern and relevance to the long-term viability of the sectors and the Gippsland region as a whole.

**Consideration four:** Improving governance and authority

Governance is structured in relatively ad hoc and fragmented ways, with limited authority. There needs to be greater clarity about who should be responsible (and to whom they should be accountable) for the economic revitalisation of the Latrobe Valley region. This issue should be addressed via a number of specific steps focused on economic development and revitalisation of the region.

**Priority one:** Create a funded (per capita levy) Regional Economic Development Commission for the Latrobe Valley region (possibly Gippsland) with authority to promote economic development across the sectors and the region (Gippsland).

**Priority two:** Ensure that the primary mandate of a Regional Economic Development Commission is the development of partnerships between LGAs, local employers and other non-government actors for the purpose of securing funding, facilitating inward investment and developing linked economic sustainability programs across the region.

**Priority three:** Enable the Gippsland Local Government Network to take steps to resource and empower such a Commission, with a clear recognition that there should be equality of involvement and benefit from the Commission.

**Consideration five:** Ensuring the sustainability of resources

Gippsland, including the Latrobe Valley region, is subject to planning uncertainty and fragmented policy development. Long-term planning principles for the whole region need to be enacted, with a single accountable authority at a Gippsland level.
**Priority one:** Develop a coordinated and interlinked planning and regulation process for the utilisation and availability of resources in the region.

**Priority two:** Establish a body modelled on the Latrobe Valley Transition Committee with the authority to approve and implement planning decisions.

**Priority three:** Establish a small but permanent support unit comprising staff from the three levels of government to ensure that all sector reports and reviews are coordinated within sectors and between them, as well as to facilitate policy approaches that take the integrity of the resource base into account.

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**Consideration six:** Maintaining the skills edge

Any successful structural adjustment program will require a skills policy focused on developing a comparative advantage via a skilled workforce. One way of promoting this is to encourage the development of a ‘next generation’ workforce development strategy involving major industry actors, training providers, higher education institutions, State Government Industry Link Officers and trade unions.

**Priority one:** Formulate and implement a Next Generation Workforce Development Strategy.

**Priority two:** Support the Local Learning and Employment Networks to develop arrangements for apprenticeship pools in at least two centres in the region.

**Priority three:** Develop and resource career awareness events as well as further develop work experience programs in the resource sectors, including forestry and agriculture.
**Consideration seven: Research and development**

Investment in research and development has proven effective in other regions as a means of promoting economic diversification. Such investment, including support for universities and tertiary education would also have substantial social benefits within and beyond the region.

**Priority one:** Improve policy by monitoring what works, including all structural adjustment programs, and what has already been done.

**Priority two:** After production of a business case that includes an appropriate research focus and cross-institutional involvement, the Centre for Sustainable Industries should be funded and developed in Gippsland.

**Priority three:** Steps should be taken to ensure that suitable sector research is undertaken by a range of research bodies (industry research associations, universities and other research organisations) as well as by local industries and related industrial organisations.

The realisation of these considerations and priorities requires a shift in approach involving the development of comprehensive policies and practices, rather than reactive and dispersed ones.
Chapter 1: The project and approach

The aim of this research project is to explore opportunities for investment and job growth in the Latrobe Valley region as the locality prepares for a period of structural adjustment. In January 2012, the Commonwealth Department of Regional Australia, Local Government, Arts and Sport commissioned the Centre for Sustainable Organisations and Work (based at RMIT University) to examine these opportunities. This region (and Gippsland as a whole) is expected to confront new challenges as changes occur in the brown-coal fired power generation industry. Securing new investment and job opportunities is crucial to the region’s future.

For the purposes of this project, the Latrobe Valley region is defined as the three local government areas of Latrobe City, Baw Baw and Wellington. The estimated population of this region in 2010 was 162,700 people (KPMG, 2011) up from 146,567 in 2006 (Fairbrother et al., 2012). The region is especially exposed to changes resulting from climate change and policies addressing climate change and, in particular, the carbon pricing associated with the Commonwealth Government’s Clean Energy Future package. Therefore, there are expectations that the Latrobe Valley region will undergo significant economic and social change in the near future.

The region is significantly resource-based. It is an area where resources such as coal, forestry, agriculture (and related production) as well as oil and gas underpin the region’s economy. The key propulsive industries have been identified as energy, mining and construction, agriculture and forestry. While the region’s economy is primarily resource-based, in terms of employment there is also a growing service sector, along with a large defence facility and a small but expanding aero industry.

The implications of government policy and programs from all levels of government, particularly in relation to the power industry, are potentially wide ranging. They include structural adjustment measures to initiate and support change, assistance for displaced workers and companies at risk, and programs for economic revitalisation.
The project

In light of plans to transition to a low-carbon economy, this project analyses the current economic and labour situation and considers the future economic and labour possibilities for the Latrobe Valley region.

Unlike other recent reports (e.g. Latrobe City, 2012; RDA, 2012) that have sought to identify ‘shovel-ready’ projects aimed at stimulating economic activity in the short term, this project identifies worker-transition possibilities for potentially displaced workers and job creation and investment opportunities in the medium to long term. The project adopts a political economy approach to analyse the region’s resource-based industries and puts forward policy approaches that take into account the diversity of political and economic interests within the region. It also attempts to balance these interests in such a manner as to establish a more sustainable economic base for the long term.

Key research questions

1. Given the changes to be brought about by carbon pricing, where is the region's future economic activity headed?

2. Where is future job growth and investment likely to occur? Are there value-adding and/or market (local and export) opportunities that could strengthen investment and job creation in the sectors?

3. What is the likely nature and skill requirements for these future jobs?

4. Are workers able to easily transition from one industry/sector to the next when opportunities emerge, or do their skills tend to be tied to a particular industry/occupation? What, if any role, do the public and private sectors have to play in assisting this transition?

5. What are the future workforce demands for these industries/sectors? Does an ageing workforce pose challenges for all these industries/sectors? In what ways are industries and companies engaging in workforce planning?

Several existing approaches to these issues have only examined the relevant industries in the Latrobe Valley through the sector and occupational categories as defined by the Australian Bureau of Statistics (ABS). In contrast, this project will investigate the economic prospects of the Latrobe Valley region by considering sectors clustered around four key resources. These are:
1. coal (and electricity)
2. oil and gas
3. forestry (paper and timber)
4. agriculture (agrifood/agribusiness).

Construction and manufacturing are addressed via the four resource sectors, because they are both integral to them and dependent upon the future of these resources.

Objectives

The objectives of the project are to:

1. determine the relative ‘health’ of each sector and its relevant industries
2. identify new job and investment opportunities for the region
3. determine whether potentially displaced workers from the power industry have requisite skills and experience in demand by other industries and sectors, and to identify where up-skilling requirements might be needed to facilitate worker and skill transition
4. identify the opportunities for future employment growth and the skill requirements needed to realise this growth
5. understand the barriers to investment and employment growth among the four sectors and their relevant industries
6. understand the linkages and areas of cooperation and competition between firms and sectors in the region, including areas of cross industry/sector employment
7. inform future planning and decision-making in the region, particularly with regard to regional workforce development and assistance.
Conceptual and methodological approach

The overall objective of this project is to analyse the current economic and labour situation as well as to consider the future economic and labour possibilities for the Latrobe Valley region in light of the plan to transition to a low-carbon economy. Several existing approaches to these issues have examined the relevant industries in the Latrobe Valley by looking at sector and occupational categories as defined by the ABS. In contrast, this project investigates the economic prospects of the Latrobe Valley region by considering sectors clustered around four key resources. As anxieties about climate change and policies addressing climate change tend to centre around specific resources, and the Latrobe Valley economy is significantly resource-based, this approach is an important one.

Categorising the four resource sectors in this way enables a more detailed investigation of the opportunities and challenges specific to each sector. The implications are twofold. First, agriculture, forestry and fishery are commonly categorised as a single sector; agriculture and forestry are exposed in different ways to the changes resulting from a transition towards a low-carbon economy, and so may experience unique challenges and require different initiatives to promote their future growth. Second, many reports broadly consider ‘oil and gas’ and ‘mining and electricity generation’ as the energy industry, listed under more than two categories by ABS. The future for the oil and gas industry, however, now looks considerably different from the future of the brown-coal fired electricity industry. Further, these two sectors are differentially located geopolitically (LGAs), economically and socially in the region. Thus, this project considers the power generation industries separately from oil and gas (including storage and transportation), with brown-coal derived electricity positioned as part of a larger coal-based sector. By categorising the four resource sectors as indicated, new challenges and opportunities can be identified.

A resource and organisational-based approach

In this report, we present a resource and organisational-based approach so as to understand opportunities and challenges in the Latrobe Valley region.

Resource-based sectors

There are four major resource-based sectors considered in this project. Reference is also made to two further sectors, construction and manufacturing, in relation to the primary focus.
1. Coal (and electricity)

Over the last two decades there has been considerable focus on coal and electricity, commencing with privatisation in the 1990s and debates about the social licence for coal extraction and electricity production. Much debate has focused on the possibility of viable alternative opportunities for brown coal (lignite) to compete with less expensive alternatives (e.g. natural gas), although there is political uncertainty along with increasing environmental regulation including carbon pricing. This sector has an ageing workforce and faces competition with other industries for skilled labour. The current owners of the coal (lignite) mines, with the tender process and time-specific contracts, in effect restrict the access of other industries to raw material, and face technological limitations and high costs associated with clean coal technologies in the medium to short term.

2. Oil and gas

The oil and gas sector includes both primary (extraction) and processing activities. This industry is highly dependent upon resource availability, whose supply is subject to multiple narratives, though significant investments have been made in recent years. The future of the power generation industry is also perceived by some as tied to gaining access to empty oil and gas wells for carbon capture and storage. Company ownership and plans for these empty wells are therefore part of the considerations for the future of this sector.

3. Forestry (timber and paper)

Critically this sector includes both primary resource and manufacturing/value-adding aspects. It is a sector facing a declining milling capacity, an uncertain political environment, falling profits, competition with other sectors for land use, an ageing workforce and a general exodus from the sector. It is a sector with a limited resource, in the form of plantation timber and native forest supply. A major focus for the sector is paper production and manufacture, with the Latrobe Valley region home to a major paper mill. This mill is technologically up-to-date but faces challenges from a mature product market, where environmentally sensitive products such as paper packaging are growing while other products face market growth limitations. For the Latrobe Valley region to secure the advantages of value-added products, some sawmills will have to be
upgraded with new and specific technologies. Overall, it is a sector competing with both cheaper timber and paper imports from South East Asia.

4. Agriculture (agrifood and agribusiness)

The study of food and agriculture covers both primary production and manufacturing processes. This sector is particularly challenged by competition for land use by other sectors. Further, the region’s farming businesses are often owned and operated by ageing farmers, with poor or limited succession planning. There is evidence of declining profitability among farm businesses due to increased costs, price-taking from retailers and food processors, and the high Australian dollar. There is increased competition from imported foods, as well as competition with other states such as Tasmania that offer certain competitive advantages over Gippsland (e.g. farm productivity, labour and land costs; government subsidies and incentives to food processors). The sector faces infrastructure challenges and costs in getting agrifoods to market locally and internationally, and it is exposed to climate change and drought risks.

One important qualification to the fourfold classification is that manufacturing and construction as broad, multi-sector areas of activity are included as part of the sectors where relevant. Manufacturing is a key activity that defines these sectors: processing agricultural products, producing paper and timber products, developing alternatives to coal-fired electricity production, and providing oil and gas as a product. Having the capacity to deliver construction underpins how and/or if future investment can be attracted into the four resource-based sectors, raising major questions regarding the capacity of local construction contract firms. There will also be a substantial number of construction jobs created through the decommissioning of power stations and mine rehabilitation. The areas of construction and manufacturing, therefore, are integral to each sector considered in this project, even though they are not identified as stand-alone sectors.

The reason for focusing the analysis on the four resource sectors is that the Latrobe Valley region’s future economic success will be built around its existing resources and industries. Resource-based industries tend to be much more embedded in regional economies than other types of industries that are less tied to a particular geography, such as information technology (IT) industries or various types of manufacturing (e.g. automobile). It is important therefore that the four resource sectors remain at the heart of the regional economy, rather than seeking to parachute in new or replacement industries. An understanding of both the resources (strengths and limitations of each resource) and their value-adding potential becomes vital. This resource-oriented focus enables a consideration of
the competition between the sectors for labour, land usage and the use and exploitation of resources. It also provides the framework for a comprehensive analysis of the opportunities for and barriers to investment, job growth, and skill development within each sector. Further, this approach raises important questions relating to the form of governance that will enable a positive future for the region and balances the needs of its diversified resource-based industries in a sustainable manner.

**Flexible organisational networks**

Each of the four resource sectors considered in this project has been shaped by dominant organisational networks and companies. These relationships change over time and operate in many cases as ‘flexible organisational networks’ – lead firms connected to a range of suppliers, contractors and associated organisations providing goods, services and maintenance. These relationships are characterised by interdependence. Forestry resources, for example, are managed in response to organisational interests, which are often in competition for the resource for the production of timber and paper products. In the case of agribusiness, dairy companies and vegetable processors are reliant on individual farms and often small suppliers and harvesters. There is overlap between the networks supporting each sector, with competition between the sectors for labour and land usage. In particular, maintenance and construction contractors as well as transport companies frequently operate across the sectors. Such networked organisations are often the product of outsourcing strategies, as is the case in power generation. They can also be the product of the structure of a particular industry, such as dairy, where processors are positioned between suppliers and the market. Such network arrangements are often facilitated by lead firms, which have the means to address organisational weaknesses (e.g. lack of technological capacity and/or expertise, high capital and labour costs, and so forth) and strengthen the network’s core activities. The priorities and interests of these lead firms, however, have major implications for the overall direction and sustainability of the industry.

The approach followed in this report is based on an understanding of the political economy of the region, of the relationship between governments, employers, workers and the residents in the region, as well as of the services and support supplied both within the region and from outside. The Latrobe Valley region’s industry and the associated workforces have been shaped by the organisational practices of network organisation (see Castells, 1996) or the ‘flexible firm’ (see Atkinson and Gregory, 1986). A networked organisation is one where lead firms rely upon an array of other enterprises, as suppliers or on a contract basis, to realise both the short and long-term goals of the lead firm.
There may be gradations of involvement and connection between lead firms and others in the sector. Some relationships are close and dependent, such as those between continuous-presence contractors (CPCs) and generators, and dairy farmers and milk processors. In the case of forestry and timber/paper, lead mills sign long-term contracts for the supply of timber. Other relationships are more distanced, such as power generators that rely on tender contracts. These contractors often also seek contracts with lead firms in other industries, for example servicing oil and gas, or delivering livestock to abattoirs.

The flexible organisational network conceptualisation enables an understanding of the sectors as both integrated and cohesive. It allows for a more comprehensive analysis of the nuances and specific skills of the labour network within each sector, as well as of the cooperative and competitive relations between sectors for particular skills. This conceptualisation also draws attention to the supply-chain relationships that define different sectors. These interactions are often complex and elongated. This is certainly exemplified in the milk-processing industry, which is characterised by a complex logistical structure and various layers of service provision (on this approach, see Lloyd and Payne, 2002 and Buchanan et al., 2001).

Research approach

The project draws on three principal sources of data. First, it considers the findings and recommendations of existing studies and reports. Second, it incorporates data from interviews conducted with key personnel within the four resource sectors, government and other relevant industries and organisations. Thirdly, the report draws on the proceedings of a series of scenario workshops held in the Latrobe Valley region as part of this study (for a full presentation of the methodology see Appendices 1 and 4).

This approach is based upon an informed analysis and identification of key strategic aims to achieve:

- economic diversification
- current and possible job opportunities
- structural adjustment in the region, in relation to a transition to a low-carbon economy.
Thus, the research report offers a distinctive perspective on opportunities and constraints unfolding in the Latrobe Valley region over the next decade.

The report

The report comprises the current chapters:

Chapter 1. The project

Plus

Chapter 2. The Latrobe Valley region current state and future scenarios

Chapter 3. Four resource sectors

Part A: Coal and electricity

Part B: Oil and gas

Part C: Forestry, timber and paper

Part D: Agriculture and agribusiness

Chapter 4. General considerations and priorities

Appendices
Chapter 2: The Latrobe Valley region

This chapter provides an overview of the current state of the region and considers future projections and prospects. It discusses recent government initiatives at the federal, state and local levels aimed at stimulating regional economic development and managing the transition to a low-carbon economy. It concludes with a consideration of future possibilities for the region, thereby locating the analysis and discussion of the four sectors.

Current state of the region

As indicated, the Latrobe Valley region is defined as the area comprising the three LGAs of Baw Baw, Latrobe City and Wellington. Bordering the region are the LGAs of East Gippsland, South Gippsland, and Bass Coast. Together these six LGAs form the area known as Gippsland (Map 2.1).

Map 2.1: Gippsland region and major transport infrastructure

The Latrobe Valley region is geographically diverse, encompassing the Great Dividing Range to the North, the Latrobe Valley with its brown (lignite) coal reserves, the beginning of the Gippsland Lakes District in the east, and part of the coastal region along the Gippsland Basin in the south. Population distribution is also diverse reflecting different settlement and economic histories. The major urban centres of Warragul, Moe, Morwell, Traralgon and Sale are all located along the region’s only major rail line providing goods and passenger services to Melbourne. The Princess Highway and to a lesser degree the South Gippsland Highway serve as the other major transportation routes for those travelling to and from the Latrobe Valley region to Melbourne. The three LGAs under study have the following characteristics:

**Baw Baw Shire**
Population: 36,179 in 2006
Major townships: Warragul and Drouin

The shire has experienced record levels of residential growth over recent years, as more people settle in the area and commute to Melbourne for work. Agriculture (dairy, beef and potatoes) and horticulture are significant contributors to the local economy, with the shire home to dairy and meat processors and a growing hydroponics industry. Residential population increases have contributed to the significant growth of construction and retail sectors in the shire. Rising property prices and land-use pressures are placing strains on the municipality’s traditional primary industries, while the provision of infrastructure to cater for the rising population and economic activity is proving challenging for the shire.

**Latrobe City**
Population: 69,000 in 2006
Major Townships: Moe, Morwell, Traralgon and Churchill

Electricity power generation (responsible for 80 per cent of Victoria’s electricity generation) and paper manufacturing represent two of the city’s most important industries. The city’s richest natural resource is its brown-coal reserves. Food manufacturing and a growing aeronautics manufacturing business are also important local industries. There is a diverse range of maintenance, manufacturing and construction companies located in the area as well as a highly skilled technical and trade qualified workforce. Education and government services (health and community services) are also major sources of employment in the municipality. With major changes ahead in the electricity generation sector, Latrobe City is at the centre of the region’s transition to a low-carbon economy.
**Wellington Shire**
Population: 40,000 in 2006
Major towns: Sale, Longford, Heyfield

Of the three LGAs, Wellington has the most diverse economy with major industries including the oil and gas sector, aviation (the RAAF base in East Sale), dairy farming in the Macalister Irrigation District, vegetable production near the coastal town of Longford, and timber milling and timber product manufacturing in Heyfield. The oil and gas sourced from the Gippsland Basin and processed onshore at Esso's Longford facilities continue to provide significant local employment. It is expected that the industry will continue to operate for the next two to three decades. Wellington’s rich agricultural and native timber resources will be significant in its economic future, as might the brown-coal seams located near the shire’s western boundary with Latrobe City. Transportation costs, Wellington’s distance from Melbourne and limited access to local port facilities are some of the challenges facing the municipality.

**Governance and authority**

The three LGAs that comprise the Latrobe Valley region are as economically divided as they are integrated. The economic ties of Baw Baw are increasingly linked to Melbourne and its south-eastern suburbs rather than the eastern parts of the Latrobe Valley region. Wellington, likewise, has a very particular and diversified economic base that provides a degree of protection from the changes taking place in Latrobe City. Further, a central road and rail artery connects these shires, allowing for the easy movement of people and commodities to and from the region, but it is necessary to note that commodities and people also move along other transportation routes, within and beyond the Gippsland region. Thus it is worth considering whether it is meaningful or helpful to consider the Latrobe Valley region as the focus of structural adjustment, or whether the focus instead should be on Gippsland as a whole. The justification for a whole-of-Gippsland approach is that the Latrobe Valley region has social and economic links with the other LGAs that constitute Gippsland (East Gippsland, South Gippsland and Bass Coast).

Another feature of the region is that it lacks a single key urban centre – Bendigo/Ballarat equivalent – and thus it is difficult to present the Latrobe Valley as a region that is coherent and integrated that can speak with one voice. Even Latrobe City, the largest LGA in the region (and Gippsland) is a series of towns rather than an integrated urban entity. Moreover, the three LGAs that comprise
the region are characterised by different economic profiles, labour markets and skills sets.

Overlaying these local government arrangements are the state and federal governments, including departments and related administrative and support services. In a variety of ways these levels of government, and particularly the state government, establish the parameters for local government decision and activity. These relationships are reflected not only in planning, water catchment usage, resources and infrastructure arrangements, but also in a large number of reports and projections for the development and future prosperity of the region.

The lack of common governance and authority in the region is contributing to a lack of decision-making on key issues, partly due to:

1. the impact of short electoral cycles and political conflicts across regional, state and federal arenas
2. a situation where state and federal governments are often seen as lacking interest in regional issues
3. the ways that local politics are often driven by vested interests, unequal capacities and power inequalities.

In the past, the region had an agency that maintained such a level of authority. The Latrobe Regional Commission established by the Cain Labor Government in 1983 was an attempt by government to coordinate economic and social development of the region. The Commission involved the regional community in regional decision-making, particularly when it came to the development of major projects. The Commission, under the Latrobe Regional Commission Act, provided assistance and guidance to the Victorian Government in relation to policies for the region. With the Kennett Government’s disbandment of the Commission, regional decisions and relations between the region and the Victorian Government became more ad hoc and often poorly coordinated.

To address the importance of coordination and to recognise the happenstance of their boundaries, the LGAs of Gippsland have created the Gippsland Local Government Network (GLGN). Established in 1998, the network aims to:

- act as a combined voice for Gippsland communities and address common areas of interest
- develop positive relationships and encourage open dialogue with both state and federal governments
• encourage community cohesion and improve general wellbeing by ensuring an ongoing commitment from other levels of government to provide and renew community infrastructure

• ensure ongoing economic growth and prosperity for the Gippsland region by securing investment in transport and communication infrastructure

• continue to support the wellbeing and living standards of all Victorians by providing reliable power, clean water and premium agricultural products

• provide for future Gippsland communities by considering and adopting environmentally responsible and sustainable practices (GLGN, 2012).

While an important development, the network derives its responsibilities from the constituent LGAs, and has limited responsibility and authority.

Identifying opportunities has not been the difficulty for the region (any number of reports including the Gippsland Regional Plan and the Directions for Latrobe Valley Transition Discussion Paper demonstrate this fact). The difficulty has been developing clear priorities and coordinated action that will assist in job creation and attracting investment. Currently, there are a wide range of lobby groups in the region, with varying capacities and strengths. These include the Committee for Gippsland (C4G), a relatively well-funded lobby group for business interests and major public bodies, and the Gippsland Climate Change Network, which advocates sustainable and ‘green’ solutions to the difficulties facing the region.

Alongside these organisations, the Gippsland Trades and Labour Council, Agribusiness Gippsland and a range of agrarian and industrial unions and associations represent specific constituencies to a range of employers, governments and related bodies. It is also the case that these bodies promote awareness and educational activities, often for their own constituencies but also for broader audiences.

The strategy for economic revitalisation in the Latrobe Valley region 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). It is important to respond effectively and decisively to economic, social and political challenges by developing the basis for a sustainable regional economy. Such a shift would take into account new and changing industries, occupational profiles and skills requirements.
Latrobe Valley region population

The population of the Latrobe Valley region is relatively large but dispersed, numbering 162,675 in 2010 (ABS, 2010). This region has an ageing population. Compared with Melbourne, there are fewer people proportionately in the 20–40-year-old age group (Regional Development Victoria, forthcoming). It is also a growing population. The Victorian Department of Planning and Community Development (DPCD) predicts that the population of the Latrobe Valley region will increase to 194,198 by 2026 (DPCD, 2011), representing an annual average growth of 1.2 per cent. This change will be driven primarily by growth in the Baw Baw Shire, where the population is projected to increase at a faster rate than the state average. Such expansion is likely to result in an over-representation of people aged 65 years or more (Edwards et al., 2011). As a result, the proportion of the population that is of workforce age in the Latrobe Valley region is likely to shrink compared with other parts of Victoria and Australia. These projections signal significant labour and skill-related challenges for the region’s industries into the future.

The Latrobe Valley region population, however, has an age profile that broadly reflects non-metropolitan Victoria. Nonetheless, there are notable differences between the three LGAs that make up the region, as depicted in Figure 2.1.

Figure 2.1: Age composition by region (2010)

![Age composition by region (2010)](image)

Source: ABS, 2006 Census of Population and Housing (provided via DRALGAS)

While broadly similar to non-metropolitan Victoria, Wellington LGA, with its extensive primary industries, comprising dairy and forestry, has a higher proportion
of persons over 45 than the others. In contrast, the population of Baw Baw has a high proportion of persons in the 5–14 years age bracket, higher than Australia as a whole, possibly reflecting the creeping urbanisation in this LGA. Latrobe LGA has a comparatively higher proportion of persons of working age than the other LGAs that make up the region, of note when labour force participation is examined.

Alongside age, skill profiles are important when evaluating the potential for a region. Tertiary qualifications are one indicator of flexibility within and between sectors, as well as the overall regional economy. These qualifications are presented by field of study and by LGA.

![Figure 2.2: Field of qualification by LGA (2006)](image)

Qualifications in engineering and related technologies are the most common in the region, followed by management and commerce, and health. The distribution within the LGAs tends to follow the patterns of employment in each LGA, with the
proportion of qualified persons in agriculture and environmental areas, health and the education sector in Baw Baw and Wellington in line with the non-metropolitan profiles. In contrast, the profile in Latrobe City follows the employment profile of the LGA, where electricity generation and manufacturing (including paper manufacture) are the major employers in the municipality.

The economy

The Latrobe Valley region’s gross regional product in 2011 was $9.14 billion (Compelling Economics, 2012), accounting for a significant proportion of the greater Gippsland gross regional product of approximately $13.26 billion, and representing three per cent of Victoria’s gross state product (Gippsland Regional Plan Project Control Group 2010: 82; Compelling Economics, 2012).

In terms of total economic output, the Latrobe Valley region generated $19.506 billion in 2011 (Compelling Economics, 2012). This translates to $8.5 billion in value-added, with Latrobe City responsible for nearly half of these economic activities (Table 2.1).

Table 2.1: Value-added by LGA and Latrobe Valley region 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>Value-added ($billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baw Baw</td>
<td>$1.5</td>
</tr>
<tr>
<td>Latrobe City</td>
<td>$4.2</td>
</tr>
<tr>
<td>Wellington</td>
<td>$2.8</td>
</tr>
<tr>
<td>Latrobe Valley region</td>
<td>$8.5</td>
</tr>
</tbody>
</table>

Source: Compelling Economics (2012)

The key industries contributing value-adding product to the Latrobe Valley gross regional product are as shown in Table 2.2: mining; electricity and gas; rental, hiring and real estate; manufacturing; and construction.

Table 2.2: Value-Added by industry, Latrobe Valley region 2011

<table>
<thead>
<tr>
<th>Industry</th>
<th>$ M</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>$1,078.28</td>
<td>13%</td>
</tr>
<tr>
<td>Electricity, gas, water and waste services</td>
<td>$934.93</td>
<td>11%</td>
</tr>
<tr>
<td>Rental, hiring and real estate services</td>
<td>$920.98</td>
<td>11%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$786.15</td>
<td>9%</td>
</tr>
<tr>
<td>Construction</td>
<td>$591.49</td>
<td>7%</td>
</tr>
<tr>
<td>Public administration and safety</td>
<td>$570.08</td>
<td>7%</td>
</tr>
<tr>
<td>Health care and social assistance</td>
<td>$528.65</td>
<td>6%</td>
</tr>
<tr>
<td>Financial and insurance services</td>
<td>$497.66</td>
<td>6%</td>
</tr>
</tbody>
</table>
Reflecting the industry and sector profile of the region, agriculture, forestry and fishing also provides a substantial contribution to value-added product in the region.

**Workforce**

The total workforce of the Latrobe Valley region numbers 66,707 people, representing a labour force participation rate of 61 per cent (ABS, 2006).

---

<table>
<thead>
<tr>
<th>Industry</th>
<th>Value</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>$478.90</td>
<td>6%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>$403.80</td>
<td>5%</td>
</tr>
<tr>
<td>Education and training</td>
<td>$397.30</td>
<td>5%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>$285.02</td>
<td>3%</td>
</tr>
<tr>
<td>Professional, scientific and technical services</td>
<td>$208.58</td>
<td>2%</td>
</tr>
<tr>
<td>Transport, postal and warehousing</td>
<td>$196.46</td>
<td>2%</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>$156.86</td>
<td>2%</td>
</tr>
<tr>
<td>Administrative and support services</td>
<td>$154.00</td>
<td>2%</td>
</tr>
<tr>
<td>Information media and telecommunications</td>
<td>$136.16</td>
<td>2%</td>
</tr>
<tr>
<td>Other services</td>
<td>$111.58</td>
<td>1%</td>
</tr>
<tr>
<td>Arts and recreation services</td>
<td>$29.46</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$8,466.33</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Compelling Economics (2012)
This is lower than the average labour force participation rate for Australia (65 per cent) (ABS, 2006). Since 2006, labour force data shows that the Gippsland statistical region has also had a lower participation rate than the Victorian average, although this trend has reversed in the past two years (ABS, 2011).

The participation rates for 2006 were 64 per cent for Baw Baw and 60 per cent each for Latrobe City and Wellington. In comparison, the participation rate for non-metropolitan Victoria was 64 per cent, while the figure for whole of the state was 65 per cent.

The proportion of the population that is of working age is presented in Figure 2.4.

Figure 2.4: The working age population by LGA

![Bar chart showing share of population aged 15+](image)

Source: ABS, 2006 Census of Population and Housing (provided via DRALGAS)

The important point to note is that despite the relatively small proportion of the Latrobe City population that is of working age, the participation rate is relatively comparable to the other two LGAs that make up the region.

The Latrobe Valley region experiences lower levels of unemployment than the Victorian average. Nonetheless, the Latrobe Valley region is persistently disadvantaged in the labour market. The Department of Education, Employment and Workplace Relations (DEEWR) attributes this to several factors (2012). The region has low levels of educational attainment, with only 10.4 per cent of the working age population holding first degrees. It is also a region with a strong dependence on manufacturing and retail trade for employment. Both of these sectors have experienced significant hardship in recent years, initially because of
the global financial crisis (GFC) and subsequently due to the negative impact of a high Australian dollar (DEEWR, 2012: 2–3).

Within the Latrobe Valley region, there are distinct gendered employment patterns in relation to industry (Table 2.3).

Table 2.3: 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><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Data Source: ABS, 2006 Census of Population and Housing

Overall, the construction, manufacturing and agriculture, forestry and fishing industries employ 39.3 per cent of the male workforce. In contrast, the industries of education and training, health care and social assistance, retail trade and education and training employ 40.2 per cent of the female workforce.
Summary

Gippsland is divided into distinct geopolitical areas, with the Latrobe Valley region comprising the central part, and East Gippsland to the east and South Gippsland and Bass Coast to the south. As a region, the three LGAs draw on different resources, although some feature in all three LGAs, and particularly the forest resource. As noted, Wellington has a relatively diverse economic base, while both Baw Baw and Latrobe City are reliant on major industries in specific sectors. In each LGA, the workforce of these sectors is ageing and male. In addition, the workforce participation rates for Latrobe City and Baw Baw are below the non-metropolitan and state averages. It is against this background and context that governments at all levels have either commissioned or carried out reports focused on the region (and often Gippsland as a whole). The aim has been to lay the foundation for an economic revitalisation of the region, and in particular to prepare the region for the nation’s move towards a low-carbon economy.

Current government initiatives

Federal, state and local governments each play a specific role in the governance of the Latrobe Valley region. There is a particularly complex political web surrounding the transition of the region to a low-carbon economy. At each level of government, policies and programs are in place to try to mitigate the impacts of the Clean Energy Future package, and to assist in the development of a sustainable economy for the Latrobe Valley region. A number of the relevant policies and programs are outlined below, although this is not an exhaustive list.

Selected federal government policy and programs

- Securing a Clean Energy Future: This program is the Commonwealth Government climate change plan. The legislative package includes the carbon pricing mechanism and aims to preserve Australia’s economic growth while reducing pollution (Commonwealth Government, 2011). Components for the package include:

  - Contracts for Closure (CFC): The Commonwealth Government asked generators to lodge expressions of interest to decommission their coal-fired power stations. The CFC program aims to negotiate the exit of around 2,000 megawatts (MW) of electricity generated by such power stations by the year 2020. (The program was withdrawn by the government on the 5 September 2012)
- $200 million Regional Structural Adjustment Fund: The Commonwealth Government will provide structural adjustment assistance to help the transition of regions and communities strongly affected by the Clean Energy Future package and its associated contracts for closure.

- Clean Business Australia: There are several programs in place to assist businesses to improve their energy efficiency. They include Climate Ready (for small to medium-sized businesses to develop new technologies and services responding to climate change) and the Green Building Fund (supporting owners of existing commercial office buildings to reduce 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 Carbon Farming Initiative: This program is a carbon-offset scheme, which allows farmers, forest growers and landholders to earn credits for carbon abatement (i.e. sequestration through vegetation). These credits can then be sold on to businesses.

- The Clean Technology Programs: $1.2 billion has been committed to two programs providing support for Australian businesses pursuing clean technology investment and innovation. Both investment programs aim to enhance the competitiveness and adaptation to climate change of Australia’s manufacturing industry by reducing the energy or carbon intensity of firms’ manufacturing processes, facilities and/or products.

- Other programs: The Clean Energy and Other Skills Package will invest up to $32 million to support tradespeople and professionals in key industries to develop the skills needed to deliver clean energy services, products and advice to Australian communities and businesses. The Clean Technology Focus for Clean Supply Chain program provides an additional $5 million over four years to: enhance the role of Supplier Advocates for the clean technologies, water and built environment sectors; develop strategies for industry development activities that enhance Australian industry involvement in the supply of goods and services for energy efficient solutions; and enhance Enterprise Connect services to these sectors (July 2012 start date).
Commonwealth initiatives to develop skills for carbon abatement include the Council of Australian Governments (COAG) Green Skills Agreement, the National Action Plan for Education for Sustainability, and the Clean Energy Skills Fund.

**Selected state government policy and programs**

- 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 development of infrastructure. The fund focuses on three key areas:
  - skills and training ($10 million Skilling the Valley program)
  - sustainable energy research and development
  - jobs and industry.

- **State of the Valley Report**: This report was funded through the Skilling the Valley program. It provides a snapshot of the Latrobe Valley region to support the development of the Latrobe Valley Industry and Employment Roadmap. The report identifies challenges and potential opportunities for the region.

- Industry Link Officers: Funded through the Skilling the Valley program, this Victorian Government initiative involves the employment of four Industry Link Officers to enable connections between employers, government, labour groups and education providers to develop long-term skill and training strategies for the Latrobe Valley region.

- Latrobe Valley Industry and Employment Roadmap: The Victorian Government has committed $5 million to developing a long-term plan for future industry and employment development. The initiative will build on the $25 million Latrobe Valley Advantage Fund to deliver a clear and achievable plan to develop the region’s industry and employment for the long term.

- The Tertiary Education Plan for Gippsland: The previous state government established an expert panel to develop this plan, which builds on the recommendations from a Skills Victoria 2009 report. In particular, Skills Victoria suggests that there is an appreciable gap in tertiary education
participation rates and attainment levels between Melbourne and regional Victoria, now addressed by the plan (Dow et al., 2011).

- Energy Technology Innovation Strategy: The objective of this Victorian Government strategy is to lower the cost of prospective sustainable energy technologies. The strategy seeks to make these technologies available to assist Victoria’s transition to a low-carbon economy.

- Clean Coal Victoria: This body was established by the Department of Primary Industries to develop ways of utilising Victoria’s coal resources in ways that are compatible with a low-carbon economy.

Local initiatives

Local initiatives have been developed in the Latrobe Valley region over the past few years and now represent a significant number of organisations and projects. These are supported primarily by the region’s local governments, but are also linked to state and Commonwealth departments and agencies, tertiary education providers and organisations and other bodies in the localities that comprise the region.

There are still significant gaps in terms of LGA planning for the Latrobe Valley region. Latrobe City has been the most proactive of the three LGAs to date in planning for a transition towards a low-carbon economy, as it is likely to be the area most directly affected by changes to coal-fired electricity generation. Baw Baw and Wellington are moving towards strategic plans, which address the importance of a carbon-constrained future but with few, if any, specific guidelines for implementation and change.

- Coal Councils of Australia: In 2009, Latrobe City and Wellington Shire became founding members of the Coal Councils of Australia. Established in 2009, the alliance seeks to represent the interests of communities likely to be impacted by carbon constraining legislation. Key objectives of the alliance are to engage in dialogue with the Commonwealth Government regarding how impacted communities will transition effectively to a low-carbon economy, and assistance in the completion of a social impact analysis to determine appropriate transitional arrangements for each impacted region.

- Latrobe City’s Low Carbon Emissions Future Transition Committee: The Committee aims to play a strong role in informing and advocating on behalf of the community on matters related to carbon reduction policies.
• Latrobe City Climate Change Consultative Committee: The Committee seeks to provide links between the Council and community stakeholders in relation to climate change.

• Securing Our Future: Latrobe City Council Low Carbon Transitional Immediate Opportunities (nd [2011]): This document constitutes a set of proposals for implementing a low-carbon transition policy in relation to sustainable jobs now and in the immediate future. Central to the report is a set of proposed projects relating to job creation from the use of brown coal in a number of different ways, ranging from environmental clean technologies and gasification technology, to a commercial demonstration plant transforming coal to oil. In addition, the plan includes projects for infrastructure development including the Gippsland Logistics Precinct costed at $10 million.

Wellington Shire Council has begun to integrate changes to the energy sector into its strategic plans, although not yet to the same degree as Latrobe City. While there is no mention of the transition to a low-carbon economy in the Wellington Council Plan 2011–2015, the shire has incorporated the concept of ‘energy transitions’ in its strategic plans for economic development and tourism, and environmental sustainability.

• Wellington Council’s Economic Development and Tourism Strategy includes recommendations to:
  - support the commercialisation of ‘advanced processing opportunities’ in the brown-coal sector
  - ensure that the shire’s interests are taken into account with regard to carbon pricing policy at a state and national level
  - participate in future infrastructure planning to help support a diversifying regional energy sector.

• Wellington Council’s Environmental Sustainability Strategy mentions the possibilities regarding renewable energy in the region, stating that there are ‘excellent opportunities for future development of renewable energy. Wellington Shire is ranked 12th overall out of 79 LGAs in Victoria for useable renewable energy potential (255 petajoules per year), and is in the top six for useable solar and geothermal energy’ (Wellington Shire Council, 2011: 18).
Baw Baw Shire, like the others, has begun to focus on the transition to a low-carbon economy.

- The Baw Baw Council Plan 2011–2015 mentions the need to ‘assist the development of a future, strong, vibrant low carbon economy’ but this comes under ‘valuing our environment’ rather than the economic section on ‘managing growth’. There are no performance measures listed for any of the aims to transition to a low-carbon economy, which again reflects the recognition of change but the lack of clarity about moving forward.

- The Baw Baw 2050 Community Vision document contains more detail regarding the transition to a low-carbon economy, including the need for the region to take advantage of new opportunities arising in a carbon-constrained world. The council aims to facilitate outcomes including:
  
  - strong and vibrant carbon reduction industry
  - locally based workforce that is ready for the new green economy
  - increased opportunities and resilience for local business
  - increased public transport solutions and new and efficient transport infrastructure to help facilitate trade and commerce (Baw Baw Shire Council, 2010).

- Baw Baw Council is also liaising with groups such as the Baw Baw Sustainability Network and Transition Baw Baw.

Overall, the efforts of the three LGAs will need to consolidate in the near future for the potential opportunities outlined in this report to be realised. The Latrobe Valley region has been the focus of considerable study over the past decade (see the Victoria Government’s State of the Valley Report). In various ways, these studies have sought to inform local, state and federal government policies and programs that provide developmental assistance to the region. A number of these studies have sought to predict the trajectory of the region’s economy and local industries.

Future scenarios

Future possibilities for the region and its workforce have been considered in a series of major reports.
Key projections

There are five major reports predicting areas of growth and decline in the Latrobe Valley region over the next 20 years. These reports are summarised in the table below.
<table>
<thead>
<tr>
<th>REPORT TITLE</th>
<th>GIPPSLAND REGIONAL PLAN</th>
<th>LOW CARBON GROWTH PLAN FOR GIPPSLAND</th>
<th>GIPPSLAND TERTIARY EDUCATION PLAN</th>
<th>LATROBE VALLEY INDUSTRY GROWTH PROJECTIONS</th>
<th>THE REGIONAL EFFECTS OF PRICING CARBON EMISSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREDICTED AREAS OF GROWTH</td>
<td>Tertiary education</td>
<td>Construction (retrofitting and eco-construction)</td>
<td>Aged care and health</td>
<td>Oil and gas (capital only – not employment)</td>
<td>Green manufacturing (only with government intervention)</td>
</tr>
<tr>
<td></td>
<td>Tourism</td>
<td>Education and training</td>
<td>Service sector</td>
<td>Service sector</td>
<td>Research and development (only with government intervention)</td>
</tr>
<tr>
<td></td>
<td>Aged care</td>
<td>Construction</td>
<td>Mining (for Wellington only)</td>
<td>Manufacturing (capital only – not employment)</td>
<td>Education and training (only with government intervention)</td>
</tr>
<tr>
<td></td>
<td>Possibly ‘clean coal’ related industries</td>
<td>Retail and tourism (lesser)</td>
<td></td>
<td></td>
<td>Gas-fired electricity production</td>
</tr>
<tr>
<td>PREDICTED AREAS OF DECLINE</td>
<td>Coal-based electricity generation</td>
<td>Coal-based electricity generation</td>
<td>Manufacturing Coal-based electricity generation</td>
<td>Mining and electricity</td>
<td>Coal-based electricity generation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Agriculture (medium term before returning to modest growth long term)</td>
<td>Agriculture (medium term before returning to modest growth long term)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brown–coal related industries</td>
<td>Brown–coal related industries</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Education and training</td>
<td>Education and training</td>
<td></td>
</tr>
</tbody>
</table>
There is clearly widespread agreement about the decline in coal-based electricity generation and many of the reports take this as a starting point. There is also widespread agreement about predicted growth in demand for health and aged care services. Only the Gippsland Regional Plan makes mention of defence and aviation as potential growth industries.

There is, however, significant disagreement with regard to other projected areas of growth and decline. While the Gippsland Regional Plan (Gippsland Regional Plan Control Group, 2010) and the Gippsland Tertiary Education Plan (Dow et al., 2011) suggest tourism as a potential growth sector, both the Latrobe Valley Industry Growth Projections (KPMG, 2011) and The Regional Effects of Pricing Carbon Emissions (Weller et al., 2011) caution against optimism with regard to tourism. Construction too is an area of contention. The Gippsland Regional Plan and the Low Carbon Growth Plan for Gippsland (Climate Works Australia, 2011) promote construction as a potential growth area, partly as a result of population growth and, in the case of the Low Carbon Growth Plan, as a result of the likely future demand for retrofitting and eco-construction (e.g. installation of solar panels). In contrast, the Latrobe Valley Industry Growth Projections suggest that population growth in the Latrobe Valley region will still be less than the Victorian average and that any increase in construction will be uneven across the Latrobe Valley region.

As shown in Table 2.5, there are some points of general agreement between the reports on prospective employment growth in the Latrobe Valley region in the next 10 to 20 years, depending on whether or not there is appropriate targeted government intervention in the region to assist the transition to renewable energies.

Table 2.5: Predicted areas of employment growth

<table>
<thead>
<tr>
<th>WITH TARGETED GOVERNMENT INTERVENTION</th>
<th>WITHOUT TARGETED GOVERNMENT INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green manufacturing</td>
<td>Health and aged care</td>
</tr>
<tr>
<td>Research and development</td>
<td>Tourism (limited)</td>
</tr>
<tr>
<td>Education and training</td>
<td></td>
</tr>
<tr>
<td>Health and aged care</td>
<td></td>
</tr>
<tr>
<td>Tourism (limited)</td>
<td></td>
</tr>
<tr>
<td>Construction (limited)</td>
<td></td>
</tr>
</tbody>
</table>
The importance of targeted government intervention is most prominent in *The Regional Effects of Pricing Carbon Emissions* report. The authors warn against the assumption that without any intervention the economy of the Latrobe Valley Region can respond to market forces and become a service-based economy. Weller and colleagues (2011) argue that, while the Valley may be able to move towards a service-based economy, the process is likely to cause significant hardship. This is firstly because in the main area of contraction – coal-based electricity and mining – there are limited transferable skills for the areas of tourism, retail, health and aged care. If it is even possible, it will certainly not be easy for displaced workers from heavy industry to transfer to the services sector. Secondly, the services industries are heavily feminised and rely on a considerable part-time workforce, with wages that in no way rival those currently offered in the masculinised energy and mining sectors. *The Regional Effects of Pricing Carbon Emissions* report, therefore, contends that the only way to secure the Latrobe Valley region’s economic and social future is to implement plans which actively promote the region as a green manufacturing and renewable energy hub: a centre for green manufacturing, research and development, as well as education and training. A similar argument has been made by Bill and others (2008) with regard to the transition towards a renewable energy economy in the Hunter Valley. They state that while a carbon price will help limit demand for coal-based electricity, the growth of the renewable or green energy sector will need additional government assistance.

Of note, there is differentiation in the way that ‘growth’ is defined. Not all of the reports draw a distinction between a sector’s employment growth, growth in output, or growth in percentage of value-added. The *Latrobe Valley Industry Growth Projections* report does make these distinctions in its predictions. Their analysis shows that while there may be possibilities for growth in terms of value-added and output in the manufacturing and oil and gas sectors, these are likely to come from technological change and capital investment. They are thus unlikely to lead to employment opportunities for those in the region. It is therefore important to be clear about the kinds of opportunities that growth in different sectors will create.

*Envisaging the future*

To assist in identifying ways forward for the Latrobe Valley region, the research team developed and conducted four scenario workshops. From the first three (attended by 28 persons in total), a summary of the challenges and opportunities in the region was developed. In the fourth workshop, participants were invited to reflect and provide feedback on the key themes that this summary captured. The
Scenarios used in the sessions present a view of the region from the perspective of the year 2022. Scenario 1 reflects on the aspirations of stakeholders for the region at the end of 2012. Scenario 2 outlines a view of the region in 2022 in which these aspirations have not been met. Scenario 3 paints a picture of a transformed region reflecting the most ambitious aspirations of workshop participants. A snapshot of each of the three scenarios is given below.

**Scenario 1 – ‘A future for the taking’**

Looking back to 2012, there was a positive vision of the Latrobe Valley region of the future that was built on the foundations of the key resource industries. There was, however, acknowledgement of the need for adaptation and change, recognition of the core value of resources to the region, focused education and training to meet social and industry needs, and advocacy for necessary infrastructure development, particularly rail.

In 2012, the key drivers for this future were seen to be partnerships: collaboration at local, state and federal levels, between public and private sectors, and across industry sectors and companies. These partnerships would promote and enable policy changes to align land-use planning with relevant needs – industry, agriculture, residential and leisure – and promote infrastructure development, primarily rail, but also air, sea and road. This would occur within a continuing strong Australian economy and rejuvenated global economies.

**Scenario 2 – ‘Paradise lost’**

Looking back now from 2022, what you see around you is derelict industrial buildings and sites, vacant shops with faded ‘to lease’ signs, ill-kept and abandoned houses and a general air of dereliction. This state comes at the end of a decade of continuing global economic turmoil, conflict in the Middle East and into areas of Asia, protectionist policies in the United States (US) and Europe and poor relations between Australia and its immediate neighbours. At the same time, in the Australian context, there was a failure to integrate policy and planning between: regional, state and federal; public and private; industry and leisure; and other such competing interests. The failure to introduce sustainable resource policies and practices has led to the early demise of the region's resource-based industries.
Scenario 3 – ‘Dare to Dream’

The map of the region in 2022 shows clearly how the key infrastructure corridor that existed and was being developed a decade ago has been exploited and expanded as the core of a revitalised region. The highway, the rail line – now double-track along its full length – and the fibre-optic broadband network link the parts of the region and its air transport and logistics hubs at Morwell and Sale. The urban centres that existed ten years ago as separate towns have developed as the key retail, office and cultural complexes of the Latrobe City. Across the region, new industry, education and leisure facilities and new residential developments have been strategically planned and located in what were the ‘spaces between’ towns. Alongside continued (often contentious) plans to export brown coal has emerged a more diversified and robust economy based on a balanced and managed approach to achieve a sustainable economy, with an expanding vegetable sector, a renewed energy hub based on innovative clean technologies and advanced manufacturing in food and forestry. One particular success was the location of bioenergy facilities processing waste food and forestry waste materials.

Identifying a way forward

These scenarios are plausible, although some are more extreme than others. There is considerable uncertainty surrounding the future of each of the four resource sectors. The debates around clean coal technologies continue and the prospects for renewable energy sources are mixed. Oil and gas, while currently providing extensive energy resources to the state economy, face a restricted timeframe given current and projected use. The forestry and timber/paper sector has a declining resource base and faces threats from cheaper imports. Agriculture and agribusiness is expanding considerably. The dairy industry faces the possibility of damaging competition between a growing number of processors and the chance that retail chains may adopt models of vertical integration in relation to milk products. In other areas of agribusiness, there has been a major contraction in processing, particularly in the meat subsector, with only two large processors left in the region. Horticulture faces pressure from urbanisation and does not have ready access to manual labour willing to work in the sector.

These four resource sectors are usually treated in isolation. However, the sectors are intimately interconnected by issues of labour and land access, transportation infrastructure, and local service provisions. All sectors confront challenges associated with scarce resources (land and water), by uncoordinated planning and support, by creeping urbanisation, increased international mobility of capital,
and limited perspectives of regional business and the LGAs. Governments at all levels have struggled to find solutions to these disadvantages. Many approaches tend to be expensive, often risky and not always equitable. Further, the governance of the region (and broader Gippsland) is fragmented and underdeveloped, resulting in a general failure to integrate the various sectoral and community interests in decision-making processes. In recognition of this, the final chapter of this report brings together the key overarching issues that apply to each of the four resource sectors but also the major factors that impact on the region as a whole. In Chapter 3, we begin by turning our attention to the specific opportunities and challenges confronting each of the four resource-based sectors.
Chapter 3: Four resource sectors

The dominant perception of the Latrobe Valley is as an old industrial region, an area of smoke stacks and industrial workers. As a result, other sectors such as forestry and agriculture are often overlooked. In addition, this perception of the Latrobe Valley region is often extended to Gippsland as a whole. For state and federal governments this results in a partial view of the region. Often, key stakeholders across and within sectors of the region are not given due recognition. It also leads to a reactive, or at best a dispersed set of policies for the region.

Gippsland’s resources will continue to underpin its current and future economic opportunities. Flexible organisational networks, developed around major companies that dominate each sector, have shaped the resource sectors. The energy resource sector, with its vast brown-coal reserves and offshore oil and gas fields, will continue to support a range of economic activities. These range from resource exploration and extraction, to processing, distribution and retailing along with a host of specialised engineering, manufacturing, construction and maintenance activities. Considerable skilled labour is employed in this broad energy sector and has specialised expertise in large-scale energy and industrial projects. Likewise, Gippsland’s land-based resources involving forestry and rich agricultural soils will continue to provide the base for current and future opportunities in forestry products and paper manufacturing, dairy and meat products, vegetable and specialised food production. In similar ways to the region’s energy resources, forestry and agricultural resources directly support and rely upon an array of businesses for their ongoing success, including manufacturing, construction, maintenance and transportation.

An embedded economy is the mark of regional revitalisation, where the distinctiveness of a region becomes its strength. In Gippsland, as noted in the Gippsland Regional Plan (2010), ‘natural resources drive the region’s, and Victoria’s, economy’ (p. 8). As stated, the resources of coal, oil and gas, forestry, and agriculture define the Latrobe Valley region and broader Gippsland. In addition, water availability sets limits to the utilisation and development of these resource sectors. Since the region is defined by these resources, it is important to consider the embedded nature of their related businesses, economic activity and their workforces. They are part of the region in ways that many other industries (such as aircraft manufacturing) are not. Hence, policy responses and considerations that recognise this embeddedness and seek to build upon them are likely to lead to sustainable economic activity in the long run. In turn, such an
approach is likely to be less reliant on direct government support to ensure that enterprises remain embedded in the region.

Economic revitalisation depends upon strategic and planned intervention by governments at all levels, as well as the active involvement of non-government actors such as business enterprises and unions. While a strategy has been developed for the Gippsland region (see Gippsland Regional Plan Control Group, 2010), there is no single authority that has the capacity to deliver its associated policies. There continues to be competing geographically based economic development agencies at the federal, state and local government. Separating the Latrobe Valley region from Gippsland is in some ways problematic. This distinction draws attention to the question of governance and authority.

Resources

A feature of the Latrobe Valley region’s resource-based economy is that each resource is subject to complex and overlapping regulatory and planning arrangements, including: water catchment, coal overlays, zoning for agriculture, and plantations. In addition, the Gippsland Integrated Land Use Plan (GILUP) is in the process of completion. It is important to note that some of these planning arrangements, such as coal overlays and flood-zone declarations, have statutory force. As such, LGA planning as well as state and federal activities are guided and sometimes limited by these provisions. The result is complex pressures in some areas, such as encroaching urbanisation in West Gippsland, and limitations on land use in other parts of the region. Proposals at all levels (e.g. transport, residential growth, commercial expansion, and employment security) are all impacted by these arrangements. In these respects, the LGAs are relatively limited in their capacities.

The impact of statutory overlays on land use, such as coal resources, impact on other economic possibilities in the area. For example, Traralgon is surrounded by a combination of coal reserves and flood-zone requirements. These factors mean that physical growth and expansion for the town should be vertical (an unlikely scenario in regional Australia) rather than horizontal. Complementing such restrictions are the apparent opportunities for urban growth and expansion in such towns as Warragul, where agricultural land – some of the most fertile in the state – is increasingly rezoned as residential. Such land-use complications are present in different ways across the Latrobe Valley region.

Planning arrangements for agricultural land use are fragmented and contentious, particularly in relation to urban and peri-urban subdivision. On the one hand,
owners may have an interest in such subdivision, for wealth and de facto superannuation arrangements, particularly where there is no succeeding generation in the business. On the other hand, the very same people may have a concern for and commitment to maintain prime agricultural land in production. These complications are further beset by: coal reservation; different and unregulated use, such as timber plantations on prime agricultural land; water restrictions in the case of horticulture; and so forth. Indeed, further complications arise when councillors have their own and often unacknowledged conflicts of interest, as developers in some cases while also being promoters of the local economy.

The other feature of these planning arrangements is that the providers who control the resources are not always organised on a regional basis, although their strategic plans may be focused on the region. In the case of water management for example, there are two authorities: Gippsland Water and South Gippsland Water. No doubt these authorities are well organised and operate in responsible ways. The difficulty is that the LGA boundaries do not necessarily align with the authority boundaries and this also creates difficulties for planning.

Broader planning decisions are made at a state level. These are subject to changes of minister and government, with seemingly unclear long-term perspectives and provisions. While strategic decisions are made at the state level, there appears to be a lack of consistency and overall support and guidance. For the resource-deficient LGAs, this situation creates uncertainty and an inability to undertake to long-term planning. For employers and potential investors, instability in the political arena makes decision-making in the medium to long term extremely difficult.

Overall, the problem is that fragmented decision-making fails to integrate various sectoral interests across the resource-based industries, and that such decisions are often informed by strong vested interests. Without a stable political environment and long-term vision on the part of governments, employers and industry associations seek to negotiate preferential arrangements that often sideline the interests of others (including other industries and sectors) and/or undermine other long-term regional developmental prospects. It is a priority that these matters are addressed. A first step would be to ensure that long-term planning principles for the whole of the region are put in place, with a single accountable authority at a Gippsland level. The reports that are in process are necessary and desirable, but equally it is critical that they are dealt with in a manner that ensures consistency and consideration for the overall resources of the region. Anything short of such a
step will mean that the current mix and fragmentation remains in place, thereby jeopardising the sustainability of the region’s resources.

Infrastructure

The Latrobe Valley region is broadly located along the major road and rail corridor of Gippsland. It links the proposed intermodal road and rail connection points at Morwell and Bairnsdale. Both of these are still in a development stage, particularly in Morwell. The argument for the construction of these intermodal points is that they will provide rail access to export gateways. They are predicated on the export potential for bulk exports as well as on the likely impact of carbon pricing on fuel costs (Merrick and Associates, 2008). The Victorian Government has not been forthcoming in either facilitating or funding these developments (Merrick and Associates, 2008). Apart from transport, the LGAs have been increasingly active in setting land aside for industrial estates, although these developments do not meet the standards that are found for industrial parks elsewhere and particularly in Europe.

With its founding and the appointment of an Executive Officer in 2001, the GLGN has been a vehicle for promoting coordination between the six LGAs, particularly via the Chief Executive Officers of each LGA. In the case of transport infrastructure there has been a gradual shift from treating transport projects in isolation, LGA by LGA, to the development of a policy for the region as a whole. More recently the project has been extended to consider the Port of Hastings as the potential primary port for the region (Merrick and Associates, 2008). Interconnection with the metropolitan suburban passenger network is also a priority.

While there has been significant public debate about infrastructure, and particularly transport, such debates are limited and often circular. This is largely because of the lack of public knowledge of any funding or business cases, although both exist. In most instances, debate focuses on: duplication of existing facilities; developer self-interest; existing port owners having exclusive approaches; short-term rather than long-term assessments. Evaluations are often based on industrial growth, population expansion and industry promotion in targeted and focused ways. In other words, the debates about transport are underdeveloped, non-contextualised and almost always take place in the absence of properly formulated business cases that assess the short term, medium term and long term. The Gippsland Transport Strategy (2008) attempts to address some of these shortcomings but it continues to confront short-term political and economic barriers. Of note, such business cases have been developed in appropriate
departments attached to the Victorian Government, although they have not been published and hence are not part of the public debate.

As the following discussion of the resource sectors will highlight, there is ongoing uncertainty around the region's governance structure, resource access and resource sustainability. Infrastructure, particularly related to road, rail and port access, presents particular challenges for the industries affiliated both directly and indirectly with all four sectors. The specific concerns and positions taken regarding these issues vary somewhat across the sectoral interests, as will be discussed, but there is a sense of urgency across the sectors in resolving these issues if a revitalised and diversified sustainable region is to be achieved.
Part A: Coal and electricity

Background

Coal and electricity generation has been at the centre of the Latrobe Valley region’s economy for almost a century. During this time, the sector has provided a reliable source of energy for Victoria as well as being a site for large-scale employment for many decades. Most of the 20th century was marked by the expansion and relative prosperity associated with the State Electricity Commission of Victoria (SECV) and its core activities in the region. With the privatisation of the SECV in the 1990s, the area experienced a major upheaval. The ownership of the industry was taken over by international companies and this was followed by major job losses, in the order of approximately 5,000 jobs lost from a workforce of 8,500 (Kazakevitch et al., 1997; Birrell, 2001). These extensive job losses are still at the heart of much social disadvantage experienced in the region today.

Unlike other states, where black coal, natural gas, hydro and other energy sources are utilised for electricity production, Victoria’s electricity (and half the state’s carbon emissions) is derived from the Latrobe Valley region’s brown-coal seams, with gas and renewable energy sources only comprising around 6 and 4 per cent respectively (Earth Resources Development Council, 2010; Climate Group, 2009). The region’s coal fields provide nearly 80 per cent of Victoria’s electricity (Latrobe City, 2010a).

Map 3.1: Sub Basins Domain Region

Source: DPI (2012)
Australia holds nearly one-quarter of the world’s brown coal (lignite) reserves and, of these, almost all (90 per cent) are located in the Latrobe Valley region (Convey, 2011). Some 60 million tonnes of coal are mined per annum at the Yallourn, Hazelwood and Loy Yang mines for the four coal-fired power generators located nearby: Hazelwood Power Station, Yallourn Power Station, Loy Yang A, and Loy Yang B. However, coal is now widely recognised to be an inefficiently used fuel for energy consumption, with around two-thirds of the resource lost in the electricity generation process (Wright and Hearps, 2010, p. 11). Furthermore, the high moisture content of the brown coal in the Latrobe Valley region makes its use far less efficient and more CO₂ intensive than other fuels (DPI, 2011b). This high moisture content contributes to low calorific values, but when dried the product carries the risk of spontaneous combustion.

Other current commercial uses of the region’s brown coal include the production of char and briquettes. In addition, a number of alternative applications for brown coal have been considered, including: gasification; diesel-type fuels; drying for export; and as fertiliser supplements. The possibility of heating and chemically treating the coal to create material similar to coking coal for steel production is also being examined (Brown Coal Innovation Australia, 2012). To date, however, these projects have not moved beyond the research and development stage or attracted major investors, despite policy and financial support from various levels of government.

The future of this sector cannot be understood without reference to a global shift towards recognising the environmental harm associated with rising carbon emissions and the need to address this harm through various means, including capping, trading and pricing carbon emissions. This move has been recognised in the Commonwealth Government’s Securing a Clean Energy Future package and is also reflected in recent legislation to price carbon; electricity generation accounts for around one-third of all Australia’s greenhouse gas emissions (Convey, 2012). Given that the Latrobe Valley is not only a hub of electricity generation, but also a hub that is largely reliant on the CO₂-intensive use of brown coal, it has been highlighted as an area that is likely to experience significant change in a carbon-constrained world. While the entire report is framed by these concerns, this section of the report will outline specific details about the coal-based electricity sector in the Latrobe Valley as well as presenting particular opportunities for transition and future challenges.
Overview of the sector

Three of the coal-fired generators and the associated mines are owned by international companies. The Paris-based GDF Suez owns Hazelwood Power Station, the Hazelwood Mine (also known as the Morwell Mine) and Loy Yang B. Yallourn Power Station (as well as TruEnergy electricity retailing) is owned by the Hong Kong-based China Light and Power. AGL Energy Ltd has a 32.5 per cent and the Tokyo-based Tokyo Electricity and Power Company (TEPCO) maintains a 67.5 per cent ownership stake in Loy Yang A (the state’s largest power station). Energy Brix is owned by HRL and represents the only solely Australian-owned facility in the region. These ownership patterns are quite fluid, with AGL Energy Ltd currently proposing a buy-out of the TEPCO stake, subject to Australian Competition and Consumer Commission (ACCC) approval. The three largest power station companies have received state and federal government funding to assist them to develop ways to lower emissions, including carbon capture technologies. As Australia takes steps to introduce climate–change mitigation policies, the behaviour and future of all these Latrobe Valley power generators and their associated communities has featured heavily in public debate.

Three generators – Hazelwood Power Station, Yallourn Power Station and Energy Brix – expressed interest in the Commonwealth Government’s Contract for Closure program (discontinued on 5 September 2012). Any closure would have had significant social and economic ramifications, well beyond the generator workforce. It is important that active plans for transition are put in place prior to any such closures. Developing an appropriate response necessitates an understanding of the post-privatisation organisational structure of the industry.

The Latrobe Valley power industry is best conceptualised as a ‘flexible organisational network’; that is, there are lead firms and layered contractors providing goods, services and maintenance. In this sector, the lead firms are the generators. These generators tend to take direct responsibility for mining and power station operations and rely upon a range of contract companies for all other activities including mine and power station maintenance, security, fire and emergency services, as well as road and building construction. Geographically, this organisational network involving generators/mines and various contractors is located in a relatively restricted geographical area, around the conurbations of Traralgon, Churchill, Morwell, Newborough and Moe.

A number of contract companies actually have a continuous presence onsite, for the CPCs undertake business activity that is closely aligned with the needs of the lead firms (i.e. generators). A particularly strong version of a CPC operates as an
alliance contractor, where the activity of the contractor is a de facto element of the core business and thus their profits are tied to the economic fortunes of the generators. Multinational corporations, such as Alstom and Silcar, have historically been well represented among the CPCs.

A more removed, diverse grouping of independent contractors is still closely linked to, and dependent upon, the ongoing operations of the lead firms. These contractors tend to rely upon procuring tender contracts with the power station owners, although they also seek similar contracts with other lead firms in other industries (e.g. oil and gas). In addition, they may or may not be on fixed-price arrangements. Finally, there is also a group of contractors that do not work directly for the lead firms. Rather, they are subcontractors that provide services to CPCs and/or independent contractors such as specialised painting or harmful materials services.

The disaggregated nature of the Latrobe Valley generation industry presents a number of challenges in defining who is employed and/or directly dependent upon the industry for their livelihood. For those directly employed by power generators in the area of coal mining and power station operations it is relatively straightforward, but as the discussion above indicates, these workers constitute only a fraction of those employed in the sector. A resource-based and flexible organisation network approach provides a heuristic and methodological device in which to better capture the breadth and depth of relationships, associations and economic activities that define the sector. Contemporary data collection techniques and categorisations, however, do not make the application of these approaches straightforward.

ABS statistics, for example, provide data on electricity generation in terms of ‘fossil-fuel electricity generation’, which includes oil, gas and coal-fired generation. This does not allow a completely detailed breakdown by the subsectors involved in this study. As a result of this ABS categorisation, the following discussion of coal and electricity sector employees may include a number of workers who are employed in gas-fired electricity generation. However, given the small number of people employed in gas-fired electricity in the Latrobe Valley region, the effect on these statistics is likely to be minimal. It should also be noted that the coal and electricity workforce is further complicated by the existence of a significant number of contract workers in the Latrobe Valley region who are seemingly employed in manufacturing and construction roles, but whose ongoing employment is dependent on the continuing functions of coal mining and coal-based electricity generation (Fairbrother et al., 2012). This context must be taken into account when reading the following section of the report.
**Employment**

Most employees in the subsector are employed in electricity generation.

Table 3.1: Employment by industry subsector – coal and electricity, Latrobe Valley region

<table>
<thead>
<tr>
<th>Industry of employment (ANZSIC06)</th>
<th>Total</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal mining</td>
<td>126</td>
<td>10.6%</td>
</tr>
<tr>
<td>Fossil-fuel electricity generation</td>
<td>999</td>
<td>83.7%</td>
</tr>
<tr>
<td>Mineral exploration</td>
<td>8</td>
<td>0.7%</td>
</tr>
<tr>
<td>Other petroleum and coal product manufacturing</td>
<td>60</td>
<td>5.0%</td>
</tr>
<tr>
<td>Petroleum and coal product manufacturing, nfd</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,193</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

The data shows that there are 1,193 workers in the Latrobe Valley region employed in the coal and electricity sector, and approximately 900 people employed in occupations undertaken by contractors in the region.

The two occupational groupings involved in this sector are significantly different on a number of key variables and so data in this section is presented for each group separately where appropriate. Table 3.2 provides a details of the industry sectors in which contractors are employed in the Latrobe Valley.
Table 3.2: Industry subsectors employing contractors affiliated with the coal and electricity sector, Latrobe Valley region, 2006

<table>
<thead>
<tr>
<th>Industry subsector</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymer product manufacturing</td>
<td>23</td>
</tr>
<tr>
<td>Primary metal and metal product manufacturing, nfd</td>
<td>3</td>
</tr>
<tr>
<td>Basic ferrous metal manufacturing</td>
<td>94</td>
</tr>
<tr>
<td>Basic non-ferrous metal manufacturing</td>
<td>32</td>
</tr>
<tr>
<td>Basic non-ferrous metal product manufacturing</td>
<td>18</td>
</tr>
<tr>
<td>Fabricated metal product manufacturing, nfd</td>
<td>16</td>
</tr>
<tr>
<td>Structural metal product manufacturing</td>
<td>39</td>
</tr>
<tr>
<td>Metal container manufacturing</td>
<td>23</td>
</tr>
<tr>
<td>Sheet metal product manufacturing (except metal structural and container products)</td>
<td>12</td>
</tr>
<tr>
<td>Other fabricated metal product manufacturing</td>
<td>58</td>
</tr>
<tr>
<td>Motor vehicle and motor vehicle part manufacturing</td>
<td>44</td>
</tr>
<tr>
<td>Other transport equipment manufacturing</td>
<td>76</td>
</tr>
<tr>
<td>Machinery and equipment manufacturing, nfd</td>
<td>12</td>
</tr>
<tr>
<td>Professional and scientific equipment manufacturing</td>
<td>6</td>
</tr>
<tr>
<td>Pump, compressor, heating and ventilation equipment manufacturing</td>
<td>28</td>
</tr>
<tr>
<td>Specialised machinery and equipment manufacturing</td>
<td>14</td>
</tr>
<tr>
<td>Other machinery and equipment manufacturing</td>
<td>49</td>
</tr>
<tr>
<td>Construction, nfd</td>
<td>14</td>
</tr>
<tr>
<td>Non-residential building construction</td>
<td>85</td>
</tr>
<tr>
<td>Heavy and civil engineering construction</td>
<td>191</td>
</tr>
<tr>
<td>Building structure services</td>
<td>25</td>
</tr>
<tr>
<td>Building installation services</td>
<td>15</td>
</tr>
<tr>
<td>Building completion services</td>
<td>3</td>
</tr>
<tr>
<td>Other construction services</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>892</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

The total workforce of 2,087, affiliated with the coal and electricity sector, represents approximately 3 per cent of the regional workforce. The two key areas of employment are electricity generation and contract work, with smaller numbers of workers employed in coal mining and other coal-related manufacturing. The sector is male dominated, with men making up 96 per cent of all employees.

A majority of the workforce are employed in trade occupations.
### Table 3.3: Occupational structure by sex – coal and electricity sector and contractors, 2006

<table>
<thead>
<tr>
<th>Occupation (ANZSCO 06)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine and stationary plant operators</td>
<td>11.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Other technicians and trades workers</td>
<td>11.3%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Automotive and engineering trades workers</td>
<td>50.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Specialist managers</td>
<td>3.9%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Engineering, ICT and science technicians</td>
<td>3.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Design, engineering, science and transport professionals</td>
<td>3.3%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Electrotechnology and telecommunications trades workers</td>
<td>3.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Mobile plant operators</td>
<td>1.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Business, human resource and marketing professionals</td>
<td>1.3%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Construction and mining labourers</td>
<td>1.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>ICT professionals</td>
<td>1.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other clerical and administrative workers</td>
<td>1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Office managers and program administrators</td>
<td>0.9%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Inadequately described</td>
<td>0.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Technicians and trades workers, nfd</td>
<td>0.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Machinery operators and drivers, nfd</td>
<td>0.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Cleaners and laundry workers</td>
<td>0.5%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Hospitality, retail and service managers</td>
<td>0.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Storepersons</td>
<td>0.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other labourers</td>
<td>0.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Labourers, nfd</td>
<td>0.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Protective service workers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Road and rail drivers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Factory process workers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Managers, nfd</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Health professionals</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Construction trades workers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Inquiry clerks and receptionists</td>
<td>0.2%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Numerical clerks</td>
<td>0.2%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Sales support workers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Not stated</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Food trades workers</td>
<td>0.0%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Personal assistants and secretaries</td>
<td>0.0%</td>
<td>10.3%</td>
</tr>
<tr>
<td>General clerical workers</td>
<td>0.0%</td>
<td>12.8%</td>
</tr>
<tr>
<td>Clerical and office support workers</td>
<td>0.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing
There is a high level of gender segregation in the sector, with men predominantly employed in trades occupations (51 per cent) and as machine and stationary plant operators (12 per cent) or other technicians and trade workers (11 per cent) while women are mainly employed in clerical and other support work.

The age profile is weighted towards the older end of the age spectrum, as indicated in Figure 3.1.

Figure 3.1: Age structure of coal and electricity employees and contractors, Latrobe Valley region

The populations of contract workers and other coal and electricity workers are significantly different in terms of age, with more than half (58 per cent) of those employed directly in the coal and electricity sector aged over 45 while two-thirds (66 per cent) of contractors are aged under 45. The average age of the contractor workforce is 39.6 years, while the average age of coal and electricity direct employees is 45.2 years (ABS, 2006).

Average weekly earnings can be distinguished between a standard working week and overtime.
Table 3.4: Average weekly hours worked by sex – coal and electricity employees and contractors, Latrobe Valley region

<table>
<thead>
<tr>
<th>Hours worked per week</th>
<th>Male</th>
<th>Female</th>
<th>Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 41 hours</td>
<td>40%</td>
<td>28%</td>
<td>39%</td>
</tr>
<tr>
<td>35–40 hours</td>
<td>54%</td>
<td>46%</td>
<td>54%</td>
</tr>
<tr>
<td>&lt; 35 hours</td>
<td>6%</td>
<td>26%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

Almost all men (94 per cent) in the sector, whether contractors or direct employees, work full-time hours, but the majority work a relatively standard working week, with only 39 per cent of workers overall working 41 hours or more per week. Women employed in the sector are more likely to work part-time or standard hours with only slightly over a quarter (28 per cent) of women workers putting in longer hours.

**Education**

Women workers are more likely to have completed Year 12 of their schooling than men, as indicated in Table 3.5.

Table 3.5: Highest level of school completed by sex – coal and electricity direct employees, Latrobe Valley region

<table>
<thead>
<tr>
<th>Highest year of school completed</th>
<th>Male</th>
<th>Female</th>
<th>Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 or equivalent</td>
<td>33.6%</td>
<td>59.2%</td>
<td>35.3%</td>
</tr>
<tr>
<td>Year 11 or equivalent</td>
<td>30.3%</td>
<td>17.1%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Year 10 or equivalent</td>
<td>24.9%</td>
<td>11.8%</td>
<td>24.1%</td>
</tr>
<tr>
<td>Year 9 or equivalent</td>
<td>5.5%</td>
<td>3.9%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Year 8 or below</td>
<td>3.7%</td>
<td>3.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Did not go to school</td>
<td>0.3%</td>
<td>3.9%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Not stated</td>
<td>1.7%</td>
<td>0.0%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Overseas visitor</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

These patterns probably reflect the relatively older age profile of men compared with women. 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 (ABS, 1997; 2002). In recent years, the rate has increased to approximately 70 per cent (ABS 1997; 2002).

Among contract workers, the completion rates are generally lower than for direct employees.

Table 3.6: Highest level of school completed – coal and electricity contract employees, Latrobe Valley region

<table>
<thead>
<tr>
<th>Highest year of school completed</th>
<th>Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 or equivalent</td>
<td>17.1%</td>
</tr>
<tr>
<td>Year 11 or equivalent</td>
<td>34.4%</td>
</tr>
<tr>
<td>Year 10 or equivalent</td>
<td>38.2%</td>
</tr>
<tr>
<td>Year 9 or equivalent</td>
<td>6.7%</td>
</tr>
<tr>
<td>Year 8 or below</td>
<td>1.1%</td>
</tr>
<tr>
<td>Did not go to school</td>
<td>0.0%</td>
</tr>
<tr>
<td>Not stated</td>
<td>2.4%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

These patterns reflect the more recent history of the contract companies. Many were established during and subsequent to the privatisation of the power generation industry.

The differences indicated above between men and women are also reflected in post-school qualifications.

Table 3.7: Post-school qualification by sex – coal and electricity direct employees, Latrobe Valley region

<table>
<thead>
<tr>
<th>Post-school qualification: level of education</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate degree level</td>
<td>1.2%</td>
<td>3.9%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Graduate diploma and graduate certificate level</td>
<td>0.8%</td>
<td>3.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Bachelor degree level</td>
<td>10.3%</td>
<td>23.4%</td>
<td>11.2%</td>
</tr>
<tr>
<td>Advanced diploma and diploma level</td>
<td>11.1%</td>
<td>10.4%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Certificate level</td>
<td>44.7%</td>
<td>22.1%</td>
<td>43.2%</td>
</tr>
<tr>
<td>Level of education inadequately described</td>
<td>1.4%</td>
<td>0.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Level of education not stated</td>
<td>2.9%</td>
<td>0.0%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>27.5%</td>
<td>36.4%</td>
<td>28.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing
Overall, direct women employees are likely to hold higher qualifications than men. Again, this reflects the relative longevity of male employment in the industry as well as the tendency not to formally recognise via qualifications the skills of these men.

The post-school qualification of contract employees is also lower than that of direct employees.

**Table 3.8: Post-school qualification – coal and electricity contract employees, Latrobe Valley region**

<table>
<thead>
<tr>
<th>Post-school qualification: level of education</th>
<th>Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate degree level</td>
<td>0.0%</td>
</tr>
<tr>
<td>Graduate diploma and graduate certificate level</td>
<td>0.0%</td>
</tr>
<tr>
<td>Bachelor degree level</td>
<td>0.7%</td>
</tr>
<tr>
<td>Advanced diploma and diploma level</td>
<td>2.7%</td>
</tr>
<tr>
<td>Certificate level</td>
<td>78.7%</td>
</tr>
<tr>
<td>Level of education inadequately described</td>
<td>0.6%</td>
</tr>
<tr>
<td>Level of education not stated</td>
<td>2.2%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>15.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

The contractor and direct employee workforce differ quite significantly on education levels, with more direct employees completing high school to Year 12 (35 per cent) compared with contractors (17 per cent), but with 85 per cent of contractors holding post-school qualifications, compared with 62 per cent of direct employees. A very high proportion of contractors hold a certificate-level qualification (79 per cent), while only 43 per cent of direct employees hold certificate-level qualifications. In both groups, those with post-school qualifications were predominantly trained in engineering and related technologies (direct workers 47 per cent, contractors 77 per cent) (ABS, 2006).

**Income**

Not surprisingly, the patterns of employment between men and women, and between direct and contract employees, are reflected in income levels.
There is a notable discrepancy of income between directly employed workers and contract workers in the coal and electricity sector. Workers employed directly in this sector also see significant benefits in their weekly rates of pay, with 85 per cent of direct employees earning $1,000 per week or more, while among contractors, only 45 per cent earn $1,000 per week or more and 55 per cent earn less than $1,000 per week.

It is also the case that women’s income is relatively normally distributed, with 65 per cent of women earning $1,000 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 $1,000 per week.

**Household composition**

While employment patterns and earning difference have a considerable bearing on the quality of family life, there are no marked differences between family composition in the industry.
Table 3.9: Family composition direct and contract employees – coal and electricity, Latrobe Valley region

<table>
<thead>
<tr>
<th>Family composition</th>
<th>Direct employees</th>
<th>Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple family with no children</td>
<td>24.7%</td>
<td>20.50%</td>
</tr>
<tr>
<td>Couple family with children</td>
<td>54.2%</td>
<td>57.50%</td>
</tr>
<tr>
<td>One parent family</td>
<td>5.0%</td>
<td>6.60%</td>
</tr>
<tr>
<td>Other family</td>
<td>0.5%</td>
<td>0.50%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>15.6%</td>
<td>14.90%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

Family composition is relatively similar across both groups of workers, with contractors slightly more likely to be in couple families with children and single-parent families. Directly employed workers are more likely to be in couple families without children or not living in family units. These differences probably reflect the differing age structures of each group of workers.

The power generator workforce

The workforce in the power generator industry is skilled and relatively stable, aged and, for many, approaching retirement. Most of these workers have been in the industry for ten years or more. Entering the workforce at a young age, and often in the pre-privatisation period, has meant that there is frequently a discrepancy between qualifications and skills, with many employees skilled, but holding no formal qualifications or skilled beyond the level of their formal qualifications; in other words, skills are not aligned with national competencies.

The prospects for power station and mine operators to find work outside the sector are extremely limited due to the nature of their skills and the lack of formal qualifications (Fairbrother et al., 2012). Many 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 which
means that many of the skills learnt on the job do not easily and clearly demonstrate transferability. In a situation involving the displacement of power industry workers, those directly employed by generators are likely to confront the greatest difficulty in securing future employment; age, narrow skill sets, limited qualifications and few experiences outside the industry all constitute barriers to securing alternative employment.

Recently, steps have been taken by two generators to formally credentialise unit controller skill sets through a process of recognition of prior learning (RPL). If these workers are made redundant, holding a formally recognised qualification may assist them to secure work with other generators. However, within the context of declining job opportunities for this type of work, some workers are sceptical about the benefits of having formalised credentials. Further, there is no evidence that the remaining generators will feel obliged to take these workers on, for age reasons, skills deficits, seniority or some other factor.

The direct employees of generator companies are relatively highly paid, well above the regional average. Because of this remuneration pattern and the skill profile in the industry, there is a complex inverse relationship between acquired skill and remuneration. In the power generation industry this relation 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 their remuneration levels, it must be recognised that these rates reflect national trends.

The contract company workforce

Since privatisation, 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: 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. Where companies provide training for apprentices, it is frequently delivered through a group-training provider, although ‘poaching’ by generating companies and other contractors often presents these companies with challenges in meeting their skill needs. This practice can undermine company
commitment to training and staff development. Of consequence for training and security of employment, CPC contracts are rarely shorter than four to five years, while independent contractors rarely receive a contract longer than several months.

Most contractors associated with the power industry have business outside the Latrobe Valley power generator sector, servicing other Latrobe Valley industries (e.g. pulp and paper, food manufacturing) and/or similar industries outside the region and interstate (including power industries in other states). Thus, it is not easy to be precise about the number of ‘power industry’ contractors or their level of dependence on the Latrobe Valley power generators. A number of CPCs, often subsidiaries of multinational corporations, are only located in the region to service the power industry.

The independent contractor workforce often undertakes highly skilled work, although remuneration levels tend to be lower than those directly employed by the generation companies. Their position in the labour market is the inverse of that of the power generator workforce, with high levels of casualisation and small numbers of permanent employees. The contractor workforce also faces similar lifecycle issues to that of the power generators, however there are specific features to contracting work. Contract workers tend to be younger than the power generator workforce, 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. Many hold trade qualifications in the areas of boiler making, fitting, electrical and/or hold a range of rigging, crane driving, scaffolding, sheet metal fabrication and welding tickets. 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.

Many of the skills held by these workers are in short supply in other parts of the country and it is not uncommon for them to have worked in the mining regions of Queensland or Western Australia for parts of their career. 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. Relocating to skill shortage areas or becoming involved in fly-in fly-out (FIFO) working arrangements are not desirable options for most of these workers.
There are signs that contract workers (particularly part-time and casual workers) are already being displaced as power generators reduce their maintenance requirements. The loss of jobs and the displacement of workers brought about by these changes are likely to intensify over the coming years.

Opportunities and challenges

The coal-fired electricity industry will not close overnight. If a ‘business as usual’ approach is adopted, then, under carbon pricing, some generators may switch to a greater reliance on gas, and others may invest in more efficient and less emissions-heavy technology as coal-fired electricity becomes more expensive. While these options may produce some limited benefits by reducing carbon emissions, they will not provide substantial assistance for the regeneration of the Latrobe Valley region. As the technologies in this sector move towards great efficiency, they also tend to become less labour intensive, in effect leaving fewer jobs. It is important, therefore, to take a broad approach to the future of the coal and electricity sector, including the possibility of generating investment to help the Latrobe Valley region transition to a more diversified energy hub (coal, gas, geothermal and renewables).

Investment and the future of brown–coal fired generation

Since privatisation, the coal and electricity generation sector has struggled to deliver the level of returns investors have expected. This situation has contributed to some volatility in the value of the assets, ownership instability and a general lack of investor and ownership commitment to upgrading the industry. The political uncertainty surrounding the treatment of carbon and carbon reduction has introduced additional challenges for the sector. With the major political parties continuing to tussle over carbon pricing and energy policy more generally, this political uncertainty remains a real feature of the organisational environment for the sector. Opting out of the sector has become a popular option for some private operators, demonstrated by the expression of interest of three local generators in the CFC program.

While one or possibly two brown–coal fired electricity generators may close by 2020, Victoria’s baseload electricity will continue to be produced by brown coal with gas-fired generation growing in significance. It is unclear, however, if the Latrobe Valley region will be successful in co-locating new gas-fired power stations with its remaining brown-coal stations.
Clean coal technologies

It is a widely held view in the sector that the region’s future brown-coal electricity generation opportunities are dependent upon improving the quality of the resource through various clean coal technologies (CCTs). CCTs can be described as technologies that improve both the efficiency and the environmental impact of coal extraction, preparation and use, and mainly relate to some reduction in greenhouse gas emissions. These range from coal upgrading and improving existing coal-fired electricity plants to so-called ‘near-zero’ emissions technologies such as CCS. CCTs may be an element of the shift required for the Latrobe Valley coal and electricity sector to enable the future development in a carbon-constrained environment.

Figure 3.3: Variations on clean coal technologies

Source: CIAB AND IEA, 2008: 26

Some of the more prominent CCTs revolve around drying or de-watering coal. As brown coal has a high water content, one major reason for the high carbon emissions associated with coal-fired electricity generation is the energy required to evaporate the water during the burning process (Convey, 2011). Therefore drying coal can increase efficiency. One way of doing this is through the Coldry Process which eliminates almost all of the water from the coal, and produces dry pellets. There were recent plans for a $400 million Coldry plant to be built in the Latrobe Valley. A joint initiative between the Australian company Environmental Clean Technologies (ECT) and the Vietnamese firm Thang Long Investment had been
proposed for the Latrobe Valley in 2010 but these plans were terminated in mid-2011 after several feasibility studies. Despite this, ECT is continuing to pursue Coldry technology with a view to exporting dry coal pellets to growing markets in Asia. Exergen has also pursued dry coal technology in the form of autoclaving. In a joint venture with Mantle Mining, there were plans to construct a demonstration plant using this de-watering technology, again with a view to exporting dried brown coal (Convey, 2011). There was however some scepticism expressed in our interviews about initiatives like these, since over the last decade several have been announced but few if any have come to fruition.

It must also be noted that the environmental gains from drying and de-watering coal are thought to be relatively limited. These technologies would still only increase the thermal efficiency of the Latrobe Valley brown coal from its current 28 per cent to around 40 per cent (Convey, 2011) and the associated reduction in terms of carbon emissions is only around 5 per cent (CIAB AND IEA, 2008). Therefore, the wisdom of pouring significant investment into these technologies, which are now seen internationally as ‘behind the times’ (CIAB AND IEA, 2008) is questionable. The product must also be price-competitive with black coal, and it is unclear if this can be achieved in the short term.

Another option which is increasingly being presented in terms of CCTs for Australia is at the other end of the spectrum – carbon capture and storage – a so-called ‘near-zero’ emissions option. At this stage, there are three main approaches to carbon capture: post-combustion systems, pre-combustion systems and oxy-fuel combustion systems (see Figure 3.4, below).
For any of these technologies to move towards a ‘near-zero’ emissions target, carbon needs to be stored as well as captured. Internationally, there are currently proposals to store CO₂ emissions in saline formations, depleted oil and gas fields, deep coal seams and shale and basalt formations (CIAB AND IEA, 2008). In the Latrobe Valley region, the Hazelwood 2030 project plans to run a pilot project that involves carbon capture by diverting emissions to a carbonation plant for conversion to calcium carbonate (Convey, 2011). There have also been suggestions regarding the storage of carbon emissions underground in Gippsland as well as in the depleted oil and gas fields of the Gippsland Basin. Such a project would require agreement with the major oil and gas companies (e.g. Esso) that currently own these fields. These companies would expect some level of compensation that may drive up the costs and threaten the viability of such a large project.

Significant issues still remain in terms of CCS technologies. Most importantly, these have generally not yet been proved on any large scale and may not be economically viable in the near future, or ever. Furthermore, there is still significant opposition to these technologies in relation to renewable energy. As Wright and Hearps (2010) note, CCS is ‘an unproved technology’ that is not expected to be commercially viable by 2020. They also claim that CCS is not, in reality, a zero or ‘near-zero’ emissions solution. The focus on these options is directing investment
away from commercially proven and scalable renewable energy solutions, such as wind, solar and geothermal energy.

Export and diversifying the use of coal

Capturing economic opportunities through the export of brown coal has been discussed for decades. The high moisture content and volatile nature of the resource have proven to be major barriers. In recent years, however, technological advances in drying, de-watering and stabilising brown coal have contributed to a renewed interest in this possibility. Several companies are now proposing to develop an export industry for brown coal, which they claim will be competitive with black coal. Environmental opposition to the export of brown coal may prove to be the major challenge for the industry as any export of brown coal for the use of power generation will still create significant CO₂ emissions, transferred offshore.

The transport infrastructure is seen by some as sufficient for a limited coal export industry. Major investments in rail and port facilities would be needed if the industry was to become a major coal exporter. Countries in South and Southeast Asia are seen as the major markets for this product. It should be noted, however, that such a development could have serious ramifications for the viability of other industries and residential areas.

There have been recent reports of a ‘Valley boom prediction’ (McRae, 2012a) based on expanding coal allocation and preparing coal for export. Some of the potential bids relate to developing coal-drying and coal-to-fertiliser plants with a view to export. However, suggestions that a move to exporting coal as pellets or fertiliser will create an economic ‘boom’ in the Latrobe Valley are somewhat overstated. As reported in The Age (Arup and Gordon, 2012) after the Victorian Government’s confirmation that it was looking to expand coal allocation again, many of the same companies that competed in the tendering processes for new leases after 2001 are now expressing interest again, despite having recently shelved similar projects.

A number of brown-coal based projects that have been discussed over the past decade include coal-to-fertiliser, coal-to-liquid fuel and coal-to-gas plants. The plants proposed for these projects are designed to operate for many years and would potentially provide some long-term employment and economic benefits to the region and state. In a few cases the development of these proposed projects may involve the opening of new coal fields. Licences for the development of ‘new’ coal fields in the Latrobe Valley in the last 10 years (e.g. the Flynn and
Gormandale coal fields) are seen as an important component in the development of these alternative coal-based industries in the Latrobe Valley region although little development has actually transpired on the ground at this stage.

There have also been proposals to expand the industry through conversion of coal to gas and diesel. In 2001, the Victorian Government offered new brown-coal leases for tender. According to recent IBISWorld reports, these were the first leases offered for public tender since the 1920s (Convey, 2011). Loy Yang Power, Australian Power and Energy Limited (APEL) and HRL were all awarded leases. APEL planned to build a plant to convert brown coal into diesel fuel and electricity, with an estimated cost of $6 billion (Gordon, 2012). The original APEL plan was to convert the coal into gas and diesel while producing electricity from the excess steam produced through the conversion process; carbon emissions would be pumped into old gas wells in Bass Strait (Convey, 2011). Like the Exergen and ECT de-watering and Coldry plants, however, the APEL plans were shelved after feasibility studies. In this instance, the studies indicated that the electricity produced was only enough to power the manufacturing process itself and therefore the plant was not commercially viable (Convey, 2011).

Price factors are likely to continue to be the major driver determining future outcomes for coal utilisation. If the business case demonstrates to investors that dried brown coal can be made price-competitive with black coal or that coal-to-oil projects can produce liquid fuels that are equivalent in price and use as crude oil, then private companies (most likely large multinational corporations) are likely to drive such developments. Prior to the GFC, economic conditions and the price of oil were headed in the required direction to drive private sector interest in these initiatives. With the global economic downturn, the economic case is no longer as strong but interest in the resource remains, albeit in anticipation of longer-term possibilities. Governments and the local community will have to remain patient for these developments to occur and prospective companies will need to behave more responsibly when making public announcements about projects in which investors and markets have not been fully secured.

**Social licence and the coal and renewable debate**

Community support for the development of any future coal-fired power station will be vital. The ongoing opposition to the HRL power station highlights the polarising nature of the technologies and the social challenges confronting these coal projects. The coal industry and agencies that support it, such as Clean Coal
Victoria, will need to do more to gain the social support for coal’s future. Currently, natural gas is perceived as a ‘clean’ alternative to coal for baseload power, making the emissions from gas the benchmark that coal-fired generation must seek to achieve if it wants to have any hope of securing approval.

Countering community opposition to coal projects is not easy in an environment where a growing body of research is identifying ways for the government to support a shift away from coal-fired electricity and associated coal products. One option that has been suggested for supporting the Latrobe Valley region in the shift to a carbon-constrained world is to use government intervention to help facilitate a transition to a renewable energy hub. Such a proposal was put forward as a recommendation in slightly different forms in the *Low Carbon Growth Plan for Gippsland* (Climate Works Australia, 2011) and *The Regional Effects of Pricing Carbon Emissions: An adjustment strategy for the Latrobe Valley* report (Weller et al., 2011). Plans to establish such a hub in the Hunter Valley region are discussed by Bill et al. (2008) and strategies to establish new energy hubs overseas are also discussed in recent work by Fairbrother et al. (2012). The basic concept is that there will ‘be a variety of jobs available in the manufacture, installation, maintenance and servicing, transport and delivery of goods, operations, sales and research and design’ of new technology for renewable energy (Bill et al., 2008: 44). Wright and Hearps (2010) also highlight that much of this technology is more established and economically viable than the proposed options for clean coal. Given an entrenched history of reliance on fossil fuels, a shift to renewables is believed to require significant government intervention, including integrated planning, reducing barriers to investment and establishing new training facilities.

Fairbrother et al. (2012), in addition to Weller et al. (2011), point to the renewal strategies put in place in the Ruhr region of Germany as creating one of the most successful transitions away from old energy and manufacturing sources to new ‘green’ technologies, research and training. This transition has involved significant state intervention, facilitated by all levels of government, as well as intense collaboration between employers, unions and education bodies. The process is therefore an active form of restructuring rather than a more passive, market-driven restructuring and it has been associated with more positive outcomes than comparable restructuring efforts in the UK and the US.

The approach taken in the Ruhr has been much more holistic than simply offering support to workers directly affected by the closure or decline of a particular industrial sector. It is a regionally based renewal program which aims to assist existing industries to ‘adapt to the new market conditions created by changes in regulatory mechanisms, such as the introduction of emissions trading schemes’.
(Weller et al., 2011: 72) and to ‘regenerate the area in line with ecological and sustainability concerns’ (Fairbrother et al., 2012: 99). Like the Latrobe Valley, the Ruhr region has seen an increase in the service sector but, instructively, this has not fully offset the employment losses from heavy industry. While active government intervention has been seen to help improve the region’s prospects, it has not been a cure-all and the area still suffers from higher-than-average unemployment. One of the improvements suggested by Fairbrother et al. (2012) is that government interventions should be made before significant economic restructuring, rather than focusing only on amelioration strategies after the planned decline or closure of a particular industry.

The shift to establishing renewable energy hubs in such regions is also supported by work such as the Zero Carbon Australia Stationary Energy Plan (Wright and Hearps, 2010). The plan accepts that areas like the Latrobe Valley, which are currently resource rich in fossil fuels, may not be resource rich in renewables such as solar and wind energy. Instead, the plan, similar to that used in the Ruhr region, would be to establish the Latrobe Valley area as a skills and training hub for new technologies and construction associated with renewable energy, building on the skills of the existing power generation workforce. Wright and Hearps (2010) also emphasise that such a move is likely to result in significantly greater employment expansion in the short, medium and long term than directing investment to clean coal technologies. To achieve this ambition, the Latrobe Valley region has a relevant skills base, energy infrastructure arrangements and technological expertise, as well as the benefits that come from an established oil and gas sector in the region, in contrast to other coal and energy resource regions.

These are all options for consideration – each with its own particular challenges, costs and benefits. For many in the Latrobe Valley, it is difficult to imagine a local economy that is not based around the region’s vast coal seams. For a growing number of people outside the region and internationally, a move towards a post-coal environment is the only option to be considered. The region must plan for both scenarios.

Considerations

Opportunities

- Clean coal technologies: These technologies range from upgrading and improving existing coal-fired electricity plants to so-called ‘near-zero’ emissions technologies such as CCS.
• Diversification: The prospects for diversification are extensive, e.g. coal to fertiliser, coal to liquid, coal to gas.

• Export: Technological advances in drying, de-watering and stabilising brown coal have contributed to a renewed interest in processing the coal ready for transportation for export.

• Transition to an energy hub: Currently the region is primarily a coal resource hub comprising the resource itself, a skilled workforce, grid infrastructure and land. The region is therefore well positioned to be developed into an energy hub, with coal as one (declining) energy resource and where there could be an incremental substitution of alternative energy resources. These alternative resources could include gas-fired power stations and renewable and recycling energy facilities.

**Barriers**

• Transport infrastructure: Export arrangements for coal depend upon effective transport arrangements including port facilities, most of which are not in place and will take a number of years to develop. The result may be developmental dislocation: without coal export it is unlikely that road-rail-port upgrades will occur; without transport upgrades there can only be limited coal export.

• Feasibility of new technologies: Many technologies for clean coal and related developments are in the process of being developed and evaluated, although there is little evidence that they will come to fruition as commercial facilities in the short term.

• Environmental concerns: The social licence for the use of coal for generating electricity is limited and likely to be further reduced over the next few years. Unless there are significant advances in clean coal technology, the export of brown coal is also likely to confront significant opposition from environmental organisations.

• Political uncertainty and inaction: Uncertainty surrounding energy policy and the treatment of carbon emissions as a result of the ongoing political debate between the major political parties and state and federal governments continues to constrain investment and clean energy technology decisions.
Priorities

Priority 3.1: The business case for the export of coal (lignite) should be developed. While led by private interests, it should be subject to the condition that any export of lignite should have a threshold standard that is equal to gas emissions, for CO₂ pollution reasons as well as for the integrity of the business case. There has been considerable debate and more speculation about such possibilities. These considerations also raise difficult questions about transport infrastructure and the possibility of opening ports, developing rail transport and so forth. The only possibility for this priority is if standards are met in terms of quality of the export product (otherwise an energy-use problem is simply being shifted from Australia to elsewhere) and because such a development is dependent on transport infrastructure. Both are long-term measures and should be examined as such, by all levels of government.

Priority 3.2: There are distinct possibilities for the alternative uses of coal (lignite). Major businesses, including the generator and mine owners, should be encouraged to take focused, small steps, to re-engineer current practices and develop new products. These measures should involve deliberate experimentation and the promotion of small-scale commercial trials. Already there is evidence that engineering and related developers and inventors, as well as major energy companies are taking steps in this more modest direction, such as some of the activity currently taking place by the Great Energy Alliance Corporation (GEAC) with its Loy Yang Power facility.

Priority 3.3: Continue to promote the Latrobe Valley region as an Energy Hub through government support at the state and federal level for locating alternative electricity generation technologies and facilities in the region. Few areas in Australia are as rich in energy resources as the Latrobe Valley region. The Latrobe Valley region is also renowned for its skilled workers in the energy production and maintenance field. The current trend is towards cleaner and diverse energy products and solutions to address both climate change concerns and energy demands. It is critical that the region be able to form a narrative that reflects these community expectations. Co-locating energy intensive industries (e.g. smelters) near the source of energy production facilities in the Latrobe Valley makes environmental sense, as it reduces electricity losses over the grid. Using waste heat from energy generators for other forms of industrial activity has been discussed for years.
but never seriously acted upon. As new gas-fired generators are proposed, it is important that the Latrobe Valley region become a destination of choice. While steps should be taken to ensure continued research in the areas of clean coal technology and carbon capture (as is happening outside Australia), the more immediate task for the Latrobe Valley region is to take steps towards building upon its energy resources (including biomass and geothermal) and associated skill assets and expertise to remain an energy hub for Australia. Doing so will require the region to demonstrate and successfully communicate the progressive steps it is taking to develop clean energy solutions. As highlighted throughout this report, many local companies and organisations already have important stories to tell in this respect.
Part B: Oil and gas

Background
The vast oil and gas resources found in the Gippsland Basin have played a critical role in Victoria’s economic development for the past 40 years. Unlike the region’s coal resource, however, there is not the level of attention granted to the oil and gas sector or the similar recognition of its contributions to the region’s economy. According to the Victorian Department of Primary Industries (DPI), the Gippsland Basin is responsible for approximately two-thirds of Australia’s cumulative oil production and about one-third of Australia’s gas production. Like the Latrobe Valley coal reserves, the Bass Strait oil and gas fields have been strategically important to Victoria’s industrial development by providing competitive advantages. The Gippsland gas fields continue to support a range of industries including power generation (primarily for peak demand periods rather than baseload power), transportation, gas retailing, minerals processing, petrochemical production and various types of manufacturing including plastics. It is therefore a strategically important area in terms of natural resources and clean energy.

The majority of Victoria’s natural gas is extracted from the Gippsland Basin off Wellington Shire's coast. Currently there are 21 offshore platforms and subsea installations operating in Bass Strait with two more being constructed as part of the $4.4 billion Kipper Tuna Turrum project. The oil and gas is extracted from offshore platforms and fed along a 600-kilometre network of underwater pipelines where it arrives onshore at the Longford Gas Processing and Crude Stabilisation Plants. Since the late 1960s, the Longford facility has supplied most of Victoria’s domestic gas requirements. Longford also supplies around 20 per cent of Australia’s crude oil requirements. Once the crude oil is stabilised at the Longford facility it is pumped along a 190-kilometre pipeline to Long Island Point near Hastings for further processing and storage prior to sale to refineries. Although there are a range of companies carrying out exploratory, drilling and extraction activities within the Gippsland Basin, the majority of the Bass Strait oil and gas fields and associated production and processing facilities are owned by Esso Australia (a subsidiary of Exxon Mobil) and BHP Billiton Petroleum in a 50:50 joint venture arrangement.
In addition to Esso’s operations, Origin Energy established a much smaller processing plant at Lang Lang in 2006 that sources natural gas from the Bass Basin’s Yolla gasfield. Known as the BassGas Project, the Yolla oil and gas field is estimated to contain enough gas to supply 10 per cent of the Victoria’s needs for the next decade (Beckwith, 2011). Santos also maintains the Patricia-Baleen gas processing plant located in Orbost in East Gippsland. The plant receives gas extracted from Nexus Energy’s Longtom gas field in the Bass Strait and transports the processed gas to the Shell’s Geelong Refinery via the Jemena Eastern Gas Pipeline (Santos, 2012).

The oil and gas sector is likely to expand in the next decade in terms of exploration and extraction, especially in light of carbon pricing and the transition towards a low-carbon economy. As a result of this transition, there are moves to shift Victoria’s reliance on coal-based electricity to gas, at least as a short- to medium-term solution. It must be noted, however, that while the sector is likely to experience limited expansion, it is not an area that employs large numbers of people (Figgis and Sanden, 2005). Indeed, employment growth in oil and gas is likely to be limited as this is a very capital-intensive sector with high uptake rates for new technology.
The resource

The Gippsland Basin oil and gas fields were first identified by BHP in the mid-1960s following three decades of geological speculation about the location of the reserves and unsuccessful experimental drilling in the area. Soon after BHP’s discovery (holder of most of the permits in the region) the company joined in a 50:50 joint venture with Esso (operator for oil and gas extraction and processing). Technology advances in underwater oil and gas exploration enabled the discovery of a series of fields in fairly rapid succession, which resulted in a significant increase in offshore and onshore facilities requiring significant construction, maintenance and operational work. Between 1967 and 1986, 14 offshore platforms were constructed at Esso’s marine terminal at Barry Beach.

In the 1990s, as the Gippsland Basin oil and gas fields reached maturity, considerable speculation occurred about the remaining reserves and how long the industry would continue to operate. BHP even showed some signs that it was preparing to leave the region. This uncertainty enabled other oil and gas companies to enter the area. Nexus Energy, a Melbourne-based oil and gas company, became involved in the Bass Strait oil and gas fields in the 1990s after it purchased the rights to the Longtom gas field following BHP’s departure. BHP had abandoned the site on the basis that it was not economically viable. While Nexus viewed this acquisition as an opportunity to gain access to the gas field, in March 2012, it confirmed that there was less gas in the field than it and its shareholders had expected (Ker, 2012).

To date, the developed fields in the Gippsland Basin have produced 3.8 billion barrels of oil and 6.5 trillion cubic feet of gas – representing 90 per cent of the initial oil reserves and nearly 60 per cent of the gas (Offshore Technologies, 2012). With the relatively recent discovery of additional oil and gas in Kipper and Turrum Fields and the decision by Esso to invest $4 billion developing the fields, a renewed confidence in the industry’s future has emerged.
It is now estimated that beyond the Kipper Tuna Turrum resources (estimated to hold 620 billion cubic feet of recoverable gas and 30 million barrels of condensate) there is some 7 trillion cubic feet of gas reserves remaining in the Gippsland Basin (Beckwith, 2011). According to Esso, the Bass Strait reservoirs are expected to produce crude oil and natural gas until at least 2030.

**Overview of the sector**

Like the coal-fired electricity generation industry, the oil and gas industry can be categorised as being made up of ‘flexible organisational networks.’ There are lead firms and layered suppliers, contractors and associated organisations providing goods, services and maintenance. In particular Esso (ExxonMobil), through its Longford processing plant, accounts for a significant portion of oil- and gas-related employment in the Latrobe Valley region. Other prominent companies (Origin Energy and Santos) directly employ relatively few staff. The contract and labour-hire firms are responsible for the bulk of employment related to the oil and gas sector. This is particularly the case with offshore work, where everything from construction and maintenance to catering and operations is organised through contract firms.
In recent years, Esso has changed its approach to contract companies. In the past, Esso relied on many different contract companies to perform different tasks. Increasingly, however, Esso relies on fewer contract companies to carry out regular maintenance and construction activities. Interviews with local contract companies suggest that this change has contributed to the loss of business for those unsuccessful in securing long-term contracts (three to five years) with Esso. These companies have adopted a range of measure to address these developments, including laying off permanent full-time staff, diversifying their businesses and attempting to pick up additional business in other localities and with other industries.

The impact of these changes on oil and gas workers is not entirely clear. Given the skill shortages, many workers who have lost their jobs appear to have been able to secure employment with the major contract companies that Esso now relies upon. Due to the large workforces required of these organisations to service quite large contractual obligations, it may be the case that many previously casual workers may have been able to finally secure permanent part-time or full-time employment. On the other hand, employees of contract companies who have lost business because of the changes in Esso’s contract and procurement practices may have experienced the loss of full-time employment and are now forced to rely upon part-time or casual work.

Esso also appears less inclined to carry out major platform construction work at Barry Beach marine terminal, as has been the previous practice. Instead, they have commissioned companies in other states and overseas to construct various components for offshore platforms, with installation becoming the major activity to occur in the region. These developments have changed the nature and type of work performed locally and the industry is no longer seen as providing the job growth opportunities of early periods.

Employment

Employment in the oil and gas sector is spread across a number subsectors, as indicated in Table 3.10.
Table 3.10: Employment by industry subsector – oil and gas, Latrobe Valley region

<table>
<thead>
<tr>
<th>Industry of employment (ANZSIC06)</th>
<th>Number</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas supply</td>
<td>60</td>
<td>9.8%</td>
</tr>
<tr>
<td>Oil and gas extraction</td>
<td>493</td>
<td>80.3%</td>
</tr>
<tr>
<td>Petroleum exploration</td>
<td>49</td>
<td>8.0%</td>
</tr>
<tr>
<td>Petroleum refining and petroleum fuels manufacturing</td>
<td>12</td>
<td>2.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>614</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

The oil and gas sector accounted for the direct employment of 614 people in the Greater Latrobe Valley in 2006 (approximately 1 per cent of all employed people in the region). Like much of the energy sector more broadly, the oil and gas industries in this region are heavily male dominated. In the Latrobe Valley, extraction jobs account for the most significant proportion of employment in the oil and gas sector, and it is likely that the vast majority of these jobs are based around the Longford processing plant in Wellington Shire. Indeed employment in the oil and gas sector in the region is largely limited to the Shire of Wellington. The Latrobe Valley Industry Growth Projections (KPMG, 2011), for example, show almost no employment or economic contribution from the oil and gas sector in the LGAs of Latrobe City or Baw Baw. It should be noted, however, that there are likely to be more indirect jobs created around the oil and gas sector that these figures do not capture, especially given the increase in contracting out activities such as maintenance and catering (Guthrie and Goldacre, 2006).

The workforce is largely older and male; of 614 workers only 38 are women.
The age structure of the oil and gas sector is relatively skewed towards the middle-age groups for men, with 64 per cent of male workers aged between 40 and 59. The average age in the sector is 44.2 years (ABS 2006). Recent IBISWorld data (Convey, 2012) supports the interview data from this project in showing that an ageing workforce is a concern for the oil and gas industry. There is a very rapid drop off in employment after the age of 60, which may be (at least in part) explained by the physical nature of much of the work required in this sector. There is an unusually high average entry age into the oil and gas industry (Figgis and Standen, 2005) and this helps to explain why there are also lower levels of employment amongst men aged less than 35. The small number of women employed in the sector tends to distort a normal distribution, and accentuates the traditional pattern of declining women’s participation during typical child-bearing and caring years.

As with coal and electricity, the workforce in the oil and gas sector is largely located in operator and trade occupations (male) with the small number of women in the industry are largely located in clerical and technical jobs, as indicated in Table 3.11.
Table 3.11: Occupational structure by sex – oil and gas, Latrobe Valley region

<table>
<thead>
<tr>
<th>Occupation (ANZSCO 06)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other technicians and trades workers</td>
<td>20.3%</td>
<td>8.8%</td>
<td>19.5%</td>
</tr>
<tr>
<td>Automotive and engineering trades workers</td>
<td>19.4%</td>
<td>0.0%</td>
<td>18.1%</td>
</tr>
<tr>
<td>Machine and stationary plant operators</td>
<td>13.9%</td>
<td>0.0%</td>
<td>12.9%</td>
</tr>
<tr>
<td>Construction and mining labourers</td>
<td>7.3%</td>
<td>0.0%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Electrotechnology and telecommunications trades workers</td>
<td>6.2%</td>
<td>0.0%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Design, engineering, science and transport professionals</td>
<td>6.0%</td>
<td>8.8%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Specialist managers</td>
<td>4.9%</td>
<td>8.8%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Engineering, ICT and science technicians</td>
<td>4.3%</td>
<td>8.8%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Other clerical and administrative workers</td>
<td>2.8%</td>
<td>14.7%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Technicians and trades workers, nfd</td>
<td>1.7%</td>
<td>0.0%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Inadequately described</td>
<td>1.3%</td>
<td>0.0%</td>
<td>1.2%</td>
</tr>
<tr>
<td>ICT professionals</td>
<td>1.1%</td>
<td>0.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Storepersons</td>
<td>1.1%</td>
<td>0.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Other labourers</td>
<td>1.1%</td>
<td>0.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Farmers and farm managers</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Hospitality, retail and service managers</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Professionals, nfd</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Business, human resource and marketing professionals</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Health professionals</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Machinery operators and drivers, nfd</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Mobile plant operators</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Labourers, nfd</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Construction trades workers</td>
<td>0.6%</td>
<td>0.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Office managers and program administrators</td>
<td>0.6%</td>
<td>0.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Clerical and office support workers</td>
<td>0.6%</td>
<td>8.8%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Personal assistants and secretaries</td>
<td>0.0%</td>
<td>11.8%</td>
<td>0.8%</td>
</tr>
<tr>
<td>General clerical workers</td>
<td>0.0%</td>
<td>20.6%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing
The primary occupations for men employed in the oil and gas sector are trades roles, including: automotive and engineering trades; and other technicians and trades workers. Interview data suggests that metal workers are some of the most in demand in this sector. Approximately 45 per cent of men in the sector are employed in trades roles, with a further 14 per cent employed in the less-skilled occupation of machine and stationary plant operators. Once again, there is marked gender segregation. Women are clustered in the administrative roles of general clerical workers, personal assistants and secretaries and other clerical and administrative roles.

The average weekly hours worked was markedly different for men when compared with women.

<table>
<thead>
<tr>
<th>Hours worked</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 41</td>
<td>63.9%</td>
<td>8.6%</td>
</tr>
<tr>
<td>35–40</td>
<td>31.0%</td>
<td>60.0%</td>
</tr>
<tr>
<td>&lt; 35</td>
<td>5.0%</td>
<td>31.4%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 3.12: Average weekly hours worked by sex – oil and gas, Latrobe Valley region

Source: ABS, 2006 Census of Population and Housing

Almost all men (95 per cent) employed in the sector work full-time, compared with only two-thirds of the women employed in the sector (69 per cent). The high proportion of men working more than 41 hours per week reflects the common shiftwork and rostering patterns in the sector. The oil and gas sector frequently utilises 12-hour shifts and rotating rosters, including week-on / week-off shifts for those working offshore. This form of shift work and rostering also helps to account for the higher-than-average wages in the sector discussed further below.

Education

Workers in the oil and gas industry in the Latrobe Valley have all attended high school, but have varying rates of retention to Year 12.
Table 3.13: Highest level of school completed by sex – oil and gas, Latrobe Valley region

<table>
<thead>
<tr>
<th>Highest year of school completed</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 or equivalent</td>
<td>31.3%</td>
<td>42.4%</td>
<td>32.1%</td>
</tr>
<tr>
<td>Year 11 or equivalent</td>
<td>27.5%</td>
<td>33.3%</td>
<td>27.9%</td>
</tr>
<tr>
<td>Year 10 or equivalent</td>
<td>29.2%</td>
<td>24.2%</td>
<td>28.9%</td>
</tr>
<tr>
<td>Year 9 or equivalent</td>
<td>6.4%</td>
<td>0.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Year 8 or below</td>
<td>2.6%</td>
<td>0.0%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Did not go to school</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Not stated</td>
<td>3.0%</td>
<td>0.0%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

Women in the sector are more likely to have completed Year 12, at a rate of 42 per cent compared to 31 per cent of men. Given the high rates of employment from trades in the oil and gas sector, a relatively low Year-12 retention rate is not unusual.

More than half the workforce has post-school certificate qualifications.

Table 3.14: Post-school qualification by sex – oil and gas, Latrobe Valley region

<table>
<thead>
<tr>
<th>Post-school qualification: level of education</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate degree level</td>
<td>0.6%</td>
<td>0.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Graduate diploma and graduate certificate level</td>
<td>0.0%</td>
<td>9.1%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Bachelor degree level</td>
<td>4.9%</td>
<td>15.2%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Advanced diploma and diploma level</td>
<td>5.8%</td>
<td>0.0%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Certificate level</td>
<td>56.5%</td>
<td>18.2%</td>
<td>54.0%</td>
</tr>
<tr>
<td>Level of education inadequately described</td>
<td>1.1%</td>
<td>9.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Level of education not stated</td>
<td>4.9%</td>
<td>0.0%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>26.2%</td>
<td>48.5%</td>
<td>27.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing
Approximately a quarter (26.2 per cent) of men and almost half (49 per cent) of women employed in the oil and gas sector do not have any post-school qualifications. The most commonly held qualification for both men and women in this sector is the certificate-level qualification, although the census data does not provide details of the level of certification. Very small numbers of workers are degree qualified (23 men and five women) and approximately 1 per cent of workers have postgraduate qualifications. Again, this is not unusual given the high rates of employment from trades which are not based on university education. This does pose an issue, however, in terms of skills transferability and retraining. For those who have not completed high school or only have limited certificate-level training it may be difficult to leave their current jobs or the sector. In the event of a downturn in oil and gas, this may limit the employability of displaced workers.

The post-school qualifications of the workforce are in industry-related fields.

Table 3.15: Field of post-school qualification, certificate level and all qualification levels – oil and gas, Latrobe Valley region

<table>
<thead>
<tr>
<th>Field of study</th>
<th>Certificate level</th>
<th>All qualification levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural and physical sciences</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Information technology</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Engineering and related technologies</td>
<td>231</td>
<td>264</td>
</tr>
<tr>
<td>Architecture and building</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Agriculture, environmental and related studies</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Health</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Education</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Management and commerce</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Society and culture</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Creative arts</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Food, hospitality and personal services</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Mixed field programs</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Field of study inadequately described</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Field of study not stated</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Not applicable (no post-school qualification)</td>
<td>0</td>
<td>138</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>273</strong></td>
<td><strong>502</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing
Amongst those who do hold a post-school qualification, the vast majority have undertaken studies in the field of engineering and related technologies. A significant number of workers also have skills in the architecture and building field, with smaller numbers having studied management and commerce.

**Income**

While formally recognised skills and qualifications are relatively low in the oil and gas industry, the standard shiftwork and rostering patterns in the sector contribute to higher-than-average levels of individual income in the Latrobe Valley. The growing demand for offshore oil and gas workers in other parts of the country has also driven up salary levels in recent years.

![Figure 3.6: Individual weekly income by sex – oil and gas, Latrobe Valley region](image)

Source: ABS, 2006 Census of Population and Housing

Amongst men employed in the sector, more than a third (38 per cent) earn $2,000 or more per week, while a further 50 per cent earn between $1,000–$1,999 per week. Only 11 per cent of men in this sector earn less than $1,000 per week. More recent data from IBISWorld confirms higher-than-average income levels in the oil and gas sector Australia-wide, with an average annual wage of $168,215.76 in
2010–11 (Convey, 2012). This skewed pattern of higher earnings is not replicated for women, with 44 per cent of all women in the sector earning $1,000 or less per week, 56 per cent earning between $1,000–$1,999 per week, and no women earning $2,000 or more per week. This differentiation may be explained by the fact that men and women tend to be employed in radically different occupations within the sector (women typically in administration and men typically in operations and management). Women are more likely than men to be employed part-time.

**Family composition**

The majority of the workforce lived in family units.

<table>
<thead>
<tr>
<th>Family composition</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple family with no children</td>
<td>25.2%</td>
<td>23.5%</td>
<td>25.1%</td>
</tr>
<tr>
<td>Couple family with children</td>
<td>54.3%</td>
<td>35.3%</td>
<td>53.0%</td>
</tr>
<tr>
<td>One parent family</td>
<td>3.4%</td>
<td>14.7%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Other family</td>
<td>1.1%</td>
<td>0.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>16.0%</td>
<td>26.5%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

While most workers lived in family units, 17 per cent of all workers lived singularly or outside a family setting. Most men employed in the sector live in couple families with dependent children (54 per cent) or in couple families without dependent children (25 per cent). Significantly, only a third of women (35 per cent) who work in this sector live in couple families with dependent children.

Supplementary data from the interviews also suggests different family/work patterns depending on the type of male employment. A male-breadwinner model is still common among those families where the husband/father has a permanent position at a large company (e.g. Esso). In this situation, it is still relatively common for a wife/mother not to have entered the workforce. However, for those families where the husband/father has a less-stable job through a contractor or labour-hire company, it is more common for a wife/mother to have a part-time or full-time job
to ensure financial stability. These differences may be important considerations in terms of assessing the types of support required for displaced workers form the electricity and coal sectors.

Opportunities and challenges

There is likely to be increasing demand for oil and gas given the transition to a low-carbon economy and a move away from coal-fired electricity. Any expansion in the area should be understood in the context of factors such as increasing technological innovation (less labour) as well as the mature state of the fields (a slowing in extraction and a decreasing interest in new projects). The recent expansion of the industry with the Kipper Tuna Turrum project highlights some of the opportunities for the industry but also how these opportunities are not necessarily translating into the opportunities for local labour as once was the case.

Expansion of operations

The $4 billion Kipper Tuna Turrum project represents one of the largest domestic gas projects on the eastern seaboard and highlights an ongoing commitment to the region’s oil and gas industry. The project represents one of the most significant contributions to employment in the sector for many years. The exploration and building phases for offshore extraction are the most labour-intensive aspects of the oil and gas industries. In these phases there is exceptionally high demand for specialised labour, albeit for a limited time period. It is therefore common for the construction of a new offshore extraction facility to require hundreds of specialist workers.

Claims from those within the industry about potential employment from the project tend to be quite optimistic. In early 2012, for example, an ExxonMobil project manager claimed that the Kipper Tuna Turrum project will sustain 1,300 full-time equivalent, Australia-staffed jobs during construction and installation (McRae, 2012a). However, this expansion will not result in many long-term stable jobs. Esso’s own figures show that the Longford plant only employs between 200 and 350 personnel (Esso, 2010) with a range of employees associated with other contract companies. The relationship between jobs created in the project stage versus operational stage is best illustrated with regard to Esso’s projections for its new gas conditioning plant (currently in early stages of development) at Longford. According to Esso’s own estimates, the demand for labour is expected to peak at around 250 on site (Esso, 2012).
A number of interviewees also made mention of their scepticism about projected employment figures coming from within the industry. One worker in the sector commented on future expansion by saying:

All you’re going to do – all this thing is for is actually to downsize that labour. It’s all going to be automatic or whatever…

(LVSA0I01)

He added that the industry figures were only likely to add up if every last person involved in the project was counted, all the way down to

the bloke at Bunnings that brings out the screws…

(LVSA0I01)

Any expansion of the industry is also unlikely to contribute to the level of employment, as in previous years. In the past, offshore platforms and gas conditioning plants tended to occur within the region. Increasingly, this type of work is being carried out in other parts of the country and/or overseas with local workers becoming involved in the installation phase of the project. Workers
performing specialised tasks such as exploration and drilling related work are increasingly being brought into the region to perform this outsourced work.

According to our interview data, a significant proportion of workers are flown in from other areas of Australia and also from overseas. Two interviewees believed that on these construction projects (such as the yet-to-be-completed Kipper Tuna Turrum project) only about 50 per cent of the contracted workers were Latrobe Valley residents. It is therefore important that any figures about employment creation are understood in the context of a specialised and highly mobile labour force operating both nationally and internationally in this sector.

The interview data also suggests that contract and labour-hire companies are not expecting any new significant expansions to operations in the short term. While there have been plans regarding the expansion of Esso’s Longford processing plant, interviewees were sceptical about employment opportunities arising from it. This may be partially due to the capital-intensive nature of the oil and gas sector, which means that significant increases in output can be achieved with only minimal increases in labour (Figgis and Standen, 2005; KPMG, 2011).

The issue of limited employment growth in the oil and gas industry must be understood in the context of a drive towards minimum staffing and that ‘each new generation of technologies tends to decrease the number of personnel deployed’ (Figgis and Standen, 2005: 20). Interviewees themselves had seen this trend intensify during their working lives. One commented:

Automation’s taken over a lot of oil and gas....A lot of it’s automated. Takes one bloke now to run what maybe ten blokes used to do five years ago.

(LVSAOIL01)

Therefore, technological development and expansion actually tends to reduce the opportunities for large increases in employment, even if there is a significant increase in terms of extraction. The KPMG report on Latrobe Valley Growth Projections, reaches a similar conclusion, stating that while there is:

[Modest growth in value-added expected in Wellington over the forecast period [2010–2030], no real change is expected in employment. This is because the main growth industry (oil and gas) is highly capital intensive, therefore while employment growth for this
sector remains (relatively strong), in absolute terms this growth translates to a modest number of employees, which flows onto a modest impact on employment levels.

(KPMG, 2011: 64)

It is important, given these trends, that the challenges to employment expansion in this sector are acknowledged and the opportunities not overstated.

Clean energy policy and the high-risk Gippsland Basin gas industry

The oil and gas industry is a notoriously high-risk capital-intensive industry (Guthrie and Goldarce, 2006). The IBISWorld report confirms that the nature of the oil and gas remains seen as ‘high risk, high return’ and that this means only large firms with the ability to service debt and invest heavily in capital are likely to invest. While the Gippsland Basin has been an important source of oil and gas for Australia for decades, the resources are located in what are now considered to be mature fields with even higher risks. As the Gippsland Basin oil and gas field has entered maturity, the quality has in some cases diminished. A recent IBISWorld report highlights that production costs are actually rising in the sector as an increasing amount of water is now being pumped out with the oil (Convey, 2012). In recent years, processors have had to contend with higher levels of mercury and other impurities than in years past. In one particular case, high mercury content resulted in the temporary closure of Santos’s Patricia-Balmen facility (Santos, 2010). The gas conditioning plant being built by Esso as part of its Kipper Tuna Turrum project will address the need to remove impurities and thereby meet environmental guidelines. These infrastructure projects, however, are significant undertakings which require a level of stability in the demand and pricing of natural gas.

The Clean Energy Futures legislation has helped the industry to convince investors that the Kipper Tuna Turrum project is worth pursuing. Strong demand for natural gas and natural–gas derived products is expected under carbon pricing, which is helping to underpin investor interest in these sorts of projects. However, threats by the opposition Coalition Party to repeal the Clean Energy Future legislation are providing a level of insecurity for the industry. Compensation and payments to the coal sector as part of the Clean Energy Future package have also been strongly criticised by those associated with the gas sector. The CEO of the Australian Pipeline Industry Association, for example, released a statement criticising the Commonwealth Government for failing to provide clear strategic direction for the natural gas sector:
There is no Federal Government assistance for the natural gas industry, but substantial assistance for renewable energy and now a further $1 billion or more for coal. This $1 billion for the coal-fired power industry is not linked to reducing emissions, and comes ahead of other proposed funding for generators to some of these generators to encourage them to close down.... At the very least, the $1 billion handout should be linked to undertakings for the highly emissions-intensive coal-fired power stations to convert to gas.

(cited in Manning, 2012: 3)

Providing clear strategic direction for the natural gas industry is critical for securing the necessary capital expenditure needed for the sector. If there are further barriers to extraction activities, such as dwindling reserves and difficulty of access as in the Gippsland Basin, this may limit the potential for future projects even further. Without this political stability, the oil and gas industry may delay major gas projects and/or choose to focus on export opportunities resulting in a major loss of a clean energy resource.

Labour shortages and wage distortion

Offering some of the best-paid work in the region, the Gippsland oil and gas industry has historically attracted some of the most highly sought-after skilled workers in the region. Workers occupying positions in industries requiring similar skill sets, such as the power generation industry, have long been attracted to the opportunities in the oil and gas industry. In this regard, the higher wages in the oil and gas industry and associated ‘poaching’ by the industry contributed to skill challenges for some other industries. It appears, however, that skills shortages are now beginning to emerge in the oil and gas sector. A number of interviewees mentioned that there were labour shortages in Gippsland’s oil and gas industry. There was some anxiety, particularly from contract firms, about the number of young men leaving the Latrobe Valley to work in more lucrative offshore employment in Western Australia. However, none of the firms seemed to suggest that they were unable to form qualified crews or find staff when there were jobs available.

The more significant issue was seen as wage distortion resulting from the boom in WA. One operations manager at a contract company commented on the wage distortion issue by saying:
[i]t’s horrifying... If you brought your widget in off your car and said ‘look, I want this fixed’ they’d be saying, ‘well...that’s going to cost you $85 an hour. You’d say ‘What’? $85 an hour. Well that’s what we have to charge.

(LVSACON03)

Therefore, employers felt there was significant competition for skilled labour and that wages had become unreasonably high, thus requiring them to charge higher rates to end users.

From the perspective of workers, however, taking short-term contract work in Western Australia (or sometimes Queensland) often made sense. A number of interviewees mentioned the trend towards fly-in fly-out labour in the industry and that the Latrobe Valley region was seen as a hub for skilled labourers in the sector. As a result, many stay living in the Valley, often with families, but undertake short-term contract work elsewhere in Australia. One interviewee suggested that the mining boom in Western Australia was still helping to fuel growth in the region because most of the money earned was still being spent where workers are permanently based in Gippsland.

Transferable skills from other sectors

One of the opportunities that the gas and oil sector presents is that the skills required have considerable overlap with the skills likely to be held by workers who may be displaced from the coal-based electricity sector in the Latrobe Valley region. Like the power generation industry, the oil and gas sector has an ageing workforce and those retiring from the sector will increase in the years ahead. Strong demand for oil and gas workers in other parts of the country adds to the local industry’s skill challenges. Transferable skills between the brown–coal fired generation industry and the oil and gas sector, however, open up the possibility for both assisting displaced power generation workers into similar types of work offering comparable remuneration and helping the oil and gas sector resolve looming skills challenges.

The oil and gas sector also offers opportunities for the same demographic of worker that may be displaced from the coal-based electricity sector. Both areas are heavily male dominated. Figgis and Standen (2005) found that rather than being recent graduates or apprentices, most new workers in the oil and gas sector
typically had between five to ten years of experience working in another industry (most often a trade, although agriculture was another notable area of recruitment). In addition they found that the entry age was relatively high and that most new workers enter the oil and gas sector in their 30s and 40s.

This opportunity was also confirmed during the interview process. When the possibility of transferring workers across from the coal-based power sector to oil and gas was raised with an HR manager at a major contract company working in oil and gas, the response was clear:

Definitely. I mean, we’re already doing it anyway. We’ve brought staff over from the power industry anyway. They’re local so they’re looking for work – because being here [in Gippsland] it can be difficult to find people that are willing to relocate... but also the power industry, the training and the safety standards are very similar, so they’re very used to the environment they’re going into.

(FIGSIOIL05)

Figgis and Standen (2005) also found that formal qualifications rarely proved to be a barrier preventing entry into the oil and gas sector, and that instead employers emphasised a potential recruit’s ‘attitude and aptitude’ which often translated, at least in part, to how well someone was likely to fit in with the existing team. While this may not be an ideal recruiting strategy, it does mean that the lack of formal qualifications (which many workers in the coal-based electricity sector face as an issue in transferring to other sectors – see Fairbrother et al., 2012) may not prove as much of a barrier to entry for displaced workers.

These trends were further supported in the project’s interview data. Interviewees confirmed that qualifications were seen as less important than on-the-job training in the oil and gas sector. Moreover, having the ‘right personality’ was seen as an important element on the recruitment process, along with ‘word of mouth’ or existing family connections in the sector.

Training

Training poses both challenges and opportunities for the oil and gas sector. Similar to the situation in the coal-fired electricity industry, most training in oil and gas is done in-house and without external accreditation. This leaves many workers without fully recognised skills, which are readily transferable to other industries.
However, as both workers and employers pointed out in our interview process, this presents a significant opportunity to expand accredited training and apprenticeship programs. As two workers in the oil and gas industry explained:

Worker 1: [T]he young ones now, talking skills wise, they haven’t got the opportunity now... Like they haven’t got any – the skills that they learn around these places, they learnt everything. Now they’re just shoved in spots around the place, and for them to go interstate they’re going to be struggling, these young blokes. They’ve got to do something around here [the Latrobe Valley] soon. The old tech schools I suppose...

Worker 2: They’ve got to revert back to the older style of apprenticeships, where people get trained properly. It might take a bit longer, none of this bloody quick, expedient, get them into the workforce so they can change a bloody oil filter stuff. They’re not learning anything.

(LVSAOIL01)

A similar message was echoed by employers who felt that older workers, especially those who had trained in pre-privatisation systems, were better equipped to deal with the demands of standard work practices in the sector. Again, the issue of expanding and extending formal training outside of the workplace was raised, here by an HR manager at a major contract company for the industry:

I think probably the biggest thing is funding around training because for us training is an overhead, so bringing new people on without the qualifications, even though I meet some people who would be great for our business, sometimes is a consequence of cost that you have to take on the people who have had previous training.

(LVSAOIL05)

The expansion and extension of existing formal training would help to maintain standards in the oil and gas sector. It would allow for greater recognition of employees’ skill sets (and therefore increase the opportunities for transfer across
industries) and would also assist in dealing with current and predicted labour shortages in this sector.

Infrastructure

The *Vision 2020 Project Report* (ACIL Tasman, 2009), prepared for the Minerals Council of Australia, warns that projected growth in all mining sectors in the Latrobe Valley region, including oil and gas, may be limited without further development of infrastructure. The report states that significant infrastructure development is needed in order to help facilitate growth.

Several other reports on the current economic situation in the Latrobe Valley and wider Gippsland have also noted the need for greater development of infrastructure. The argument is that infrastructure development should not only be for commercial use but also an extension of the public transport network to help facilitate the mobility of residents and, therefore, labour (e.g. Dow et al., 2011; Gippsland Regional Plan Project Control Group, 2010).

Concerns regarding transport infrastructure, in particular rail and port infrastructure, were also reflected in some of our interview data. An operations manager for a contract company in the oil and gas industry, for example, stated that transport was a critical area for the industry and that it required government intervention. He commented that:

> I think the federal government…need to make commitments to large infrastructure projects, okay, whether that be road transports, sea, air, rail. I think with good infrastructure come a number of efficiencies. It gives access to markets… Big infrastructure projects would be great for everyone in this region.

*(LVSAOIL03)*

While a lack of infrastructure is currently seen as a barrier to be overcome, this could also be seen by governments, and potentially also private industry, as an opportunity. In the short term, large infrastructure projects would offer the possibility of renewal for the Latrobe Valley region. They may prove particularly helpful in terms of employment for displaced power workers from the electricity sector. In the medium to long term there may be, as this operations manager suggests,
increases in efficiency as well as new business opportunities arising from a greater ease of connection with other areas in Victoria, Australia and globally.

Considerations

Opportunities

- Increasing demand: With the shift away from coal use in electricity production, gas-fired generators are now being built and commissioned. There is also an increasing use of gas industrially and domestically, as well as a continuing and growing demand for oil. Strong demand for natural gas and natural gas derived products is expected under carbon pricing, which is helping to underpin investor interest in these sorts of projects.

- Similar skill sets for displaced workers from coal and electricity: Already there is evidence that many workers who have lost their jobs in the power generation sector have been able to secure employment with the major contract companies that service the oil and gas sector, although prospects for job growth are limited.

- Construction of new projects in the Gippsland Basin: There are limited opportunities to continue the development of the oil and gas fields and associated facilities, creating potential work in the construction and maintenance field for specialised and highly skilled labour. Contract and labour-hire firms are responsible for the bulk of employment in this area.

Barriers

- Low prospects for job growth: The oil and gas industry is capital intensive, with limited prospects to increase the workforce, unless linked to employment in construction and maintenance.

- The end of locally based construction by the major company: The lead company appears less inclined to carry out major platform construction work locally as has been the previous practice. Increasingly, it commissions companies interstate and overseas to construct various components for offshore platforms, with installation becoming the major activity to occur in the region. Thus a corporate decision limits job opportunities for the regional workforce within the sector.
• Maturity of the fields in the Gippsland Basin (declining reserves in the medium term, despite current expansion): The issue of declining reserves exacerbates the issue of the high-risk nature of investment in the sector.

**Priorities**

**Priority 3.4:** The establishment of targeted worker-transition assistance packages for displaced power generation workers to acquire work in the oil and gas industry. The oil and gas industry is one of the only Latrobe Valley region industries that draws upon similar skills sets and provides similar remuneration as those found in the brown-coal power generation sector. Assisting displaced power generation workers to obtain access to the oil and gas industry would enable them to remain in the region and provide financial support for their households in a similar capacity. Oil and gas companies and associated contract companies should be provided government support for any additional training costs associated with employing a displaced power generation industry employee. Such a program could help the oil and gas industry to address skill shortages associated with an ageing workforce and migration of skilled workers to other regions.

**Priority 3.5:** Maintain the Latrobe Valley region as an energy hub by commissioning and locating all future gas-fired power stations within the Latrobe Valley region. Compared with the average carbon emissions from coal-fired generation, natural gas produces half as much carbon dioxide. As the price of carbon begins to increase in the years ahead, natural gas will become a more price-competitive and desirable fuel for electricity generation. The State of Victoria and electricity generation companies are preparing for such a development. The Latrobe Valley region, however, does not appear to be the locality of choice for the commissioning of gas-fired power stations.

Securing gas-fired generators for the Latrobe Valley region would help maintain existing electricity infrastructure, support jobs, local skills and associated expertise among contractors within the region.

**Priority 3.6:** Open up access to natural gas infrastructure across the Latrobe Valley region. Access to natural gas is critical to the success of many manufacturing, food processing, dairying and hydroponics businesses operating in the Latrobe Valley region. Many of these businesses are located
in areas where access to natural gas is not fully established. It is often left up to the company to bear the costs of gaining access to natural gas infrastructure, forcing some to rely on more polluting or expensive forms of energy. For potential investors, the inability to access natural gas without significant costs to them can be a major disincentive for investing in the region.

**Priority 3.7: Develop key strategies for natural gas utilisation as part of the roll-out of the CEF legislation and the transition to a low-carbon economy.**

Australia's long-term economic wellbeing and success in lower emissions will partially depend upon how well it makes use of its natural gas reserves. As a low–carbon emitting resource which is less expensive than renewables and clean coal technologies, it can play a vital role in Australia’s clean energy future and value-adding opportunities. The Dow Chemical Company's *Advanced Manufacturing Plan for Australia* (2012) notes the importance of natural gas in securing Australia's manufacturing industry:

> Natural gas, be it as a fuel or feedstock for downstream processing, is an essential component of advanced manufacturing industries. When used as a feedstock, natural gas creates additional value as much as eight times the value of the gas itself. This far exceeds the value generated by selling the gas as LNG.

(p. 11)
Part C: Forestry, timber and paper

Background

The forestry and paper industries of the Latrobe Valley region contribute more than $1.1 billion per year to the local economy (ABS, 2006; Gippsland Private Forestry, 2005). Forestry activity began in the region in the mid to late 1800s, and focused for almost a century on felling the dense native forest for timber and to open up the land for settlement, farming and mining (Cameron, 2005; Department of Natural Resources and Environment, 1999). From 1918, the Forests Commission of Victoria managed the timber extraction from native forests through a log allocation system (Department of Natural Resources and Environment, 1999). As early as the 1930s, plantations of eucalypt and pine species were established across Gippsland to regenerate the land and supplement the timber being sourced from native forests (Cameron, 2005). Degradation was particularly bad in the ‘Heartbreak Hills’, or the Eastern Strzelecki Ranges, where settlers had tried unsuccessfully for decades to convert the forest into fertile farmland (Cameron, 2005). Plantations across the region were largely established by the Forest Commission of Victoria, but were also grown by private companies such as APM Forests Pty Ltd whose paper mill began operation at Maryvale in 1939 (Department of Natural Resources and Environment, 1999). The majority of plantations in the Latrobe Valley region remained publicly owned until 1998, when they were acquired by Hancock Victoria Plantations (HVP). Today HVP owns around 92 per cent of the plantations in the region (Gippsland Private Forestry, 2005).

Forestry is woven into the histories of many of the Latrobe Valley region’s communities. Many townships in the Strzelecki Ranges, such as Boolarra to the south of Morwell, were established as timber communities sourcing wood from the surrounding forests (Boolarra Gippsland, 2005). In the north of the region, settlements at the feet of the Great Dividing Range, such as Erica and Noojee, grew and survived in part because of their timber industries (Australia for Everyone, 2010). Logging and timber milling was also significant to the economies of many of the region’s historical townships including Jindivick, Toongabbie, and even the gold mining hub of Walhalla (Baw Baw Shire Council, 2011a; Toongabbie Community, 2011; Walhalla Heritage and Development League, 2004). In the east of the Latrobe Valley region, the township of Heyfield remains a community defined by its forestry and timber industries. Heyfield was born as a timber community in the 1860s and became a regional hub for timber milling following the 1939 bushfires (Fletcher, 1993). Today the forestry and timber/paper sector continues to provide employment for over half the township’s working population (Coakes Consulting, 2009). Other communities in the region that remain
dependent on the sector today include Rosedale, where around 25 per cent of the working population is employed in the sector, and Yarram, where it accounts for almost 15 per cent of the town’s workers (Coakes Consulting, 2009). Even larger townships such as Morwell have almost 7 per cent of their workforce employed in the forestry and timber/paper sector. In neighbouring Traralgon, the largest township in the Latrobe Valley region, the figure is 9 per cent (Coakes Consulting, 2009).

The forestry, timber and paper sector has faced a number of serious challenges over recent decades. Initially, the future of forestry looked promising. In 1996 the Commonwealth Government developed a plan to treble the nation’s plantation area by the year 2020 (see MCFPA, 1997), with implications for the future of the Latrobe Valley region and broader Gippsland. This promise was short-lived. The region’s hardwood timber supply was significantly reduced by the Victorian Government’s 2002 decision to reduce harvesting in state forests by 31 per cent (see DNRE, 2002). Across Central and East Gippsland, this decision contributed to the closure of 15 of the region’s 30 timber mills (CPI Strategic, 2010). At the same time, the region’s mills faced competitive pressures in relation to productivity and technical efficiency. Many mills relied on outdated technology and had neither the capital nor the volume to support technological upgrades. More recently, takeovers and mergers, failed investment schemes, cheap timber imports and since 2008, the strong Australian dollar, have all shaped the sector’s economic climate. In addition, the social licence for the sector has been impacted by political decisions, environmental agendas and social attitudes. These developments create stark challenges for forestry, timber and paper in the Latrobe Valley region and Gippsland more broadly.

The resource

In 2005, the Latrobe Valley region was home to 405,000 hectares of harvestable public native forest, and 96,000 hectares of plantations managed by HVP (Gippsland Private Forestry, 2005). These areas are depicted in Map 3.4.
The areas of harvestable public native forest are concentrated in the north of the region in the foothills of Mount Baw Baw, from Neerim South and Noojee in the west across to Glenmaggie in the east. There is also an area of harvestable public native forest in the south-east of the region between Glenmaggie and Yarram. Plantations in the Latrobe Valley region are primarily spread across the Strzelecki Ranges, to the south of the region’s main townships. There are particular concentrations along the Strzelecki Highway to Mirboo North, across the Merrimans Creek Valley north of Gormandale, between Rosedale and Longford in the east of the region, and to the north of Stratford, around Stockdale.

While most of the harvestable area is made up of public native forest, the region’s wood is sourced almost equally from native forest and plantations. The plantation areas are harvested more intensively, accounting for 54 per cent of the region’s wood production (Gippsland Private Forestry, 2005). Around 75 per cent of wood
harvested in the Latrobe Valley region is processed locally, with some plantation softwood supplied to mills elsewhere in Victoria and about a third of harvested public native forest hardwood exported overseas in the form of woodchips (Gippsland Private Forestry, 2005).

The harvestable public native forests throughout the Latrobe Valley region are managed by the Department of Sustainability and Environment, with VicForests the commercial body responsible for carrying out wood harvesting operations. Most of this forest consists of lower-quality mixed species, with alpine ash and mountain ash making up 11 per cent and 9 per cent respectively of the harvestable public native forest area (Gippsland Private Forestry, 2005). Less than 10 per cent of the public native forest area across the region is considered old growth (Keenan and Ryan, 2004). Hardwood from Gippsland’s public native forests is primarily turned into chips for export, with almost half of the harvested logs used for this purpose, and in East Gippsland about 80 per cent of all trees cut down in a typical coupe are converted into woodchips (Victorian Rainforest Network, 2012). The logs are either transported by rail from Bairnsdale to Corio Bay, Geelong, where they are woodchipped and exported, or by road to Eden, New South Wales, for chipping and export. Of the remaining hardwood logs harvested from the public native forests, around 23 per cent are sawlogs of varying grades and a further 23 per cent are classed as pulplogs (Gippsland Private Forestry, 2005).

The region’s hardwood plantations occupy 33,000 hectares of land, with the dominant species being Tasmanian blue gum and shining gum (Gavran and Parsons, 2011). Mountain ash is also grown, accounting for around 24 per cent of the hardwood plantation area. The Latrobe Valley region’s softwood plantations occupy 62,000 hectares and are comprised almost entirely of radiata pine (Gavran and Parsons, 2011). Close to 54 per cent of the softwood harvested from these plantations is used for sawlogs, with most of the remaining softwood production dedicated to pulplogs. In contrast, around 80 per cent of the region’s plantation-grown hardwood is harvested for pulpwood. However, the region’s hardwood plantations do produce the only substantial amount of plantation-grown hardwood sawlog in the Victoria, with some of HVP’s blue gum and shining gum plantations dedicated to both sawlog and pulplog production (National Institute of Economic and Industry Research, 2009).

The Latrobe Valley region’s forest and plantation resources are limited and declining. The Victorian bushfires of 2009 destroyed more than 16,000 hectares of HVP’s softwood and hardwood plantations across the state, and over half of this loss occurred in the Latrobe Valley region (Sewell, 2009). The value of the lost plantation resource was in the tens of millions of dollars, with replanting expected
to cost around $25 million (Sewell, 2009). The resultant shortage of plantation wood will be felt in seven to ten years, and the company has been forced to declare force majeure on its two major long-term contracts. While VicForests also suffered considerable losses in the same bushfires, none of its harvestable public native forest within the Latrobe Valley region was affected. However, the harvestable public native forest areas managed by VicForests did suffer considerable losses in the 2006–07 bushfires (Victorian Association of Forest Industries, 2009).

The sector faces an uncertain future. For the industry to survive, it will be necessary not only to secure the current supply, but also ensure that the supply will be replenished in the near future. Over the past decade, the plantation area within the Latrobe Valley region has moderately increased. An additional 5,000 hectares of eucalypts have been established, primarily to produce pulpwood for the paper industry (Gavran and Parsons, 2011). However, only a few hundred hectares of radiata pine have been added. Further expansions to the plantation resource are limited by land availability and capital.

**Forestry product industries**

Nowhere else in Victoria is there such a concentration of forestry and forest product activity in a relatively limited area. The region’s timber and paper mills are centrally located, surrounded by the plantations and native forests from which they source their fibre. This differentiates the region from the rest of the state, where the sector resource is far more dispersed. While most wood fibre is sourced from the region, and broader Gippsland, a number of mills source a percentage of their wood fibre from outside Gippsland, particularly from the public native forests in the Central Highlands. Regionally based mills produce pulp, paper, sawn timber and preservation timber. Some mills also carry out further processing to produce more value-added timber goods such as trusses and frames, furniture, timber pallets and laminated timber. Wood-derived landscape materials are also produced in the region.

The largest mill in the Latrobe Valley region is Australian Paper’s mill at Maryvale (Text Box 3.1). It is owned by Nippon Paper, Japan (a major beneficiary in Japan of exported wood chip from the region). Australian Paper is the producer of pulp and paper in the region, and the Maryvale mill is the largest of its kind in Australia (Australian Paper, 2010). It primarily produces fine paper that is sold domestically under the brand names of Reflex, Tudor, and Olympic. The mill is by far the largest consumer of wood fibre in the Latrobe Valley region, processing 42 per cent of logs harvested from the region’s forests and plantations (Gippsland Private
Forestry, 2005). The mill also uses imported plantation pulp, de-inked pulp and waste paper in its production processes (Australian Paper, 2010).

Text box 3.1: Australian Paper Maryvale Mill

A range of small- to medium-size timber mills operate within the region, processing plantation-grown softwood and hardwood sourced predominantly from native forests. The largest softwood timber mills in the region are in Yarram and Morwell, owned and operated by Carter Holt Harvey. The mill at Morwell processes 300,000 cubic metres of pine logs per year into a range of products including structural timber and industrial-grade green case timber for export. The Yarram mill processes 135,000 cubic metres of pine logs per year into outdoor products such as sleepers and fence palings. The pine logs are sourced entirely from HVP’s Gippsland plantations. The two mills employ a combined workforce of around 240 people.
The region’s largest hardwood mill is located in Heyfield. This mill is in fact the largest hardwood mill in Australia, processing an annual volume of 155,000 cubic metres of hardwood logs. The Heyfield mill comprises two sites at opposite ends of the town: one site a green mill and the other a processing facility. The mill was until this year owned and operated by Gunns Limited, with details of the recent sale of the mill soon to be announced. Heyfield’s principal hardwood timber mill has indeed changed hands various times over the past decade, owned by the Neville Smith family until 2006 when it was acquired by ITC Timber. Gunns Limited purchased the mill from ITC Timber in 2009. The Heyfield mill directly employs a workforce of around 200 people, with a further 300 people indirectly (Hill and Venables, 2010). The hardwood processed at the Heyfield mill is 100 per cent Victorian ash, which since 2003 has been sourced entirely from sustainable native forest regrowth in the Central Highlands (Gunns Timber Products, 2012). Whereas in 2000, most of the Heyfield mill’s sales were in various grades of sawn timber, in 2012 the mill concentrates on manufacturing advanced timber products using finger-jointing and laminating technologies. Victorian ash products from Heyfield are not only consumed domestically but also shipped to locations across Europe.

These three medium to large mills dominate the timber and paper processing in the Latrobe Valley region. Australian Paper and Carter Holt Harvey are the principal customers of HVP, and indeed most of the timber from the Latrobe Valley region’s plantations is committed to these two contracts. However, there are also some smaller mills producing niche products including Radial Timber Australia at Yarram (Text box 3.2). At present, this mill sources its timber from public native forest, but the company has established 1,500 hectares of hardwood plantations across Southern Victoria with a 20-year plan to shift to predominantly plantation-grown eucalypt (Lambert, 2011). Other smaller timber mills and manufacturers in the region include Fishers in Morwell, producing pallets and crates from locally sourced plantation softwood, Dahlsens in Bairnsdale, Alberton Timber and Treatment Plant in Alberton, McCormack Demby Timber at Morwell and the Supertruss factory in Heyfield.
Company name: Radial Timber Australia

- **Business type:** hardwood timber mill and sawing technology
- **Location:** Yarram (Wellington LGA)
- **Ownership:** Elmman Pty Ltd (Australia)
- **Employees:** 10 direct employees plus local contractors
- **Facility features:** Radial sawing mill and processing facility
- **Sourcing:** harvestable public native forest and hardwood plantations
- **Products:** Shiplap, board and batten, weatherboards, decking, flooring and lining, screen boards, poles and wedges, furniture
- **Market:** domestic

Radial Timber Australia has pioneered unique sawing technology that maximizes the timber obtained from Eucalypt hardwood logs. The technology is compatible with smaller logs and thus may be suited to plantation grown Eucalypts.

The mill is operated by Radial Timber Australia under licence from Radial Corporation. The mill is also linked to Heartwood Plantations, a Gippsland-based plantation company, from whom they plant a source most of their timber within the next 20 years.

The radial sawing technique produces timber with a unique appearance that has attracted the support of various architectural firms and designers in Australia. Architectural projects that have used this timber include the Uluru Visitors Centre, Churchill Island Visitors Centre, Healesville Sanctuary, Platypus House and Moorooduc Winery Estate.

**Image 1:** The Moorooduc Estate Winery by Gregory Burgess Architects

Source: Gregory Burgess Architects, 2012

Text box 3.2: Radial Timber Australia and Radial Corporation Ltd

A number of mills in the Latrobe Valley region are actively engaged in reusing the by-products from their milling processes. Australian Paper’s Maryvale mill is an example of an integrated mill, where 40 per cent of the mill’s electricity needs are generated onsite through the combustion of lignin removed from the wood in the pulping process. The Maryvale mill also sources water from the neighbouring Gippsland Water Factory, which treats up to 35 million litres of wastewater every day (Gippsland Water, 2012). Carter Holt Harvey burns the residues from their timber milling processes to make steam, which they then use to dry the timber before it is treated. They also send the woodchips from both of their mills to Australian Paper at Maryvale, as do other timber mills in the region including the Heyfield mill. The forestry and timber/paper sector in the Latrobe Valley region is therefore highly integrated, in terms of both the cogeneration activities of
individual mills and the relationships between businesses (Gippsland Private Forestry, 2005).

Overview of the sector

The forestry, wood products and paper sector in the Latrobe Valley employs 2,405 people (approximately 4 per cent of all employment in the region (ABS, 2006).

Table 3.17: Employment by industry subsector – forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulp, paper and paperboard manufacturing</td>
<td>856</td>
<td>35.6%</td>
</tr>
<tr>
<td>Log sawmilling and timber dressing</td>
<td>443</td>
<td>18.4%</td>
</tr>
<tr>
<td>Forestry and logging</td>
<td>359</td>
<td>14.9%</td>
</tr>
<tr>
<td>Other wood product manufacturing</td>
<td>279</td>
<td>11.6%</td>
</tr>
<tr>
<td>Printing and printing support services</td>
<td>162</td>
<td>6.7%</td>
</tr>
<tr>
<td>Furniture manufacturing</td>
<td>117</td>
<td>4.9%</td>
</tr>
<tr>
<td>Pulp, paper and converted paper product manufacturing, nfd</td>
<td>92</td>
<td>3.8%</td>
</tr>
<tr>
<td>Converted paper product manufacturing</td>
<td>55</td>
<td>2.3%</td>
</tr>
<tr>
<td>Other manufacturing</td>
<td>27</td>
<td>1.1%</td>
</tr>
<tr>
<td>Wood product manufacturing, nfd</td>
<td>15</td>
<td>0.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2405</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

A third (36 per cent) of all those employed in the sector, work within pulp, paper and paperboard manufacturing, while significant proportions are also employed in sawmilling and timber dressing (18 per cent) and logging (15 per cent).

The sector is overwhelmingly male dominated, with 87 per cent of all employees male (ABS, 2006).
Figure 3.8: Age and gender of employees – forestry, timber and paper, Latrobe Valley region.

Source: ABS, 2006 Census of Population and Housing

The average age of those employed in the industry is 40.9 years, slightly lower for women. There are relatively few employees aged 60 years or over within the sector.

The occupational structure of the sector is clustered around operators and trade skilled (male) and clerical and associated work (women).
### Table 3.18: Occupational structure by sex – forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory process workers</td>
<td>18.4%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Machine and stationary plant operators</td>
<td>17.9%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Other technicians and trades workers</td>
<td>10.0%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Automotive and engineering trades workers</td>
<td>9.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Specialist managers</td>
<td>6.4%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Mobile plant operators</td>
<td>6.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Design, engineering, science and transport professionals</td>
<td>4.5%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Farm, forestry and garden workers</td>
<td>3.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Construction trades workers</td>
<td>3.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Electrotechnology and telecommunications trades workers</td>
<td>3.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Road and rail drivers</td>
<td>3.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Engineering, ICT and science technicians</td>
<td>2.2%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Other clerical and administrative workers</td>
<td>1.0%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Business, human resource and marketing professionals</td>
<td>0.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Inadequately described</td>
<td>0.9%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Storepersons</td>
<td>0.9%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other labourers</td>
<td>0.8%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Technicians and trades workers, nfd</td>
<td>0.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Chief executives, general managers and legislators</td>
<td>0.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hospitality, retail and service managers</td>
<td>0.7%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Machinery operators and drivers, nfd</td>
<td>0.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Office managers and program administrators</td>
<td>0.6%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Construction and mining labourers</td>
<td>0.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Cleaners and laundry workers</td>
<td>0.5%</td>
<td>3.7%</td>
</tr>
<tr>
<td>ICT professionals</td>
<td>0.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Numerical clerks</td>
<td>0.4%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Sales assistants and salespersons</td>
<td>0.4%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Health professionals</td>
<td>0.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Sales representatives and agents</td>
<td>0.3%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Arts and media professionals</td>
<td>0.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Skilled animal and horticultural workers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Protective service workers</td>
<td>0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Managers, nfd</td>
<td>0.1%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Farmers and farm managers</td>
<td>0.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>General clerical workers</td>
<td>0.1%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Inquiry clerks and receptionists</td>
<td>0.1%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Personal assistants and secretaries</td>
<td>0.0%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Clerical and office support workers</td>
<td>0.0%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Sales support workers</td>
<td>0.0%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

*Source: ABS, 2006 Census of Population and Housing*
The highest concentration of workers are employed as factory process workers and machine and stationary plant operators (36 per cent of male employees). A further 19 per cent of men are employed in the more skilled trade occupations, in engineering trades and other trades and technicians. Relatively small proportions of women are employed in these operational roles, with the largest proportions of women found in the administrative roles, as numerical clerks and general clerical workers. The hours worked reflect gender divisions within the industry.

Table 3.19: Average weekly hours worked by sex – forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Hours worked</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 41</td>
<td>50.8%</td>
<td>15.5%</td>
</tr>
<tr>
<td>35–40</td>
<td>41.6%</td>
<td>43.5%</td>
</tr>
<tr>
<td>&lt; 35 per week</td>
<td>7.7%</td>
<td>41.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

Approximately 92 per cent of men employed in the sector work full-time, with more than half working more than 41 hours per week. In contrast, 41 per cent of women employed in the sector work part-time, with only 15 per cent of women working the longer hours worked by the majority of men.

The workforce has relatively low levels of school completion at the Year 12 level.

Table 3.20: Highest level of school completed by sex– forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Highest year of school completed</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 or equivalent</td>
<td>27.1%</td>
<td>37.3%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Year 11 or equivalent</td>
<td>25.5%</td>
<td>25.4%</td>
<td>25.4%</td>
</tr>
<tr>
<td>Year 10 or equivalent</td>
<td>29.7%</td>
<td>25.1%</td>
<td>29.1%</td>
</tr>
<tr>
<td>Year 9 or equivalent</td>
<td>10.6%</td>
<td>8.1%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Year 8 or below</td>
<td>5.2%</td>
<td>2.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Did not go to school</td>
<td>0.2%</td>
<td>0.0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Not stated</td>
<td>1.9%</td>
<td>2.0%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
While less than 0.5 per cent of workers in the forestry, timber and paper sector did not attend school, relatively low proportions of these workers remained at school to complete Year 12. Just over a quarter of men and a third of women completed the highest level of schooling, with approximately a quarter of each completing both Year 11 and Year 10.

The low levels of formally recognised skills and qualifications in the industry can be seen in Table 3.21, which shows that 46 per cent of men and 60 per cent of women employed in the industry do not have any form of post-school qualification.

Table 3.21: Post-school qualification by sex – forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Post-school qualification: level of education</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate degree level</td>
<td>0.8%</td>
<td>0.0%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Graduate diploma and graduate certificate level</td>
<td>0.2%</td>
<td>1.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Bachelor degree level</td>
<td>5.3%</td>
<td>10.7%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Advanced diploma and diploma level</td>
<td>3.5%</td>
<td>7.6%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Certificate level</td>
<td>39.5%</td>
<td>15.2%</td>
<td>36.5%</td>
</tr>
<tr>
<td>Level of education inadequately described</td>
<td>1.4%</td>
<td>1.7%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Level of education not stated</td>
<td>3.1%</td>
<td>2.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Not applicable (no post-school qualifications)</td>
<td>46.2%</td>
<td>60.9%</td>
<td>48.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

The most common post-school qualification held by workers in the forestry, paper and wood product sector is a certificate-level qualification. The census data does not provide a detailed breakdown of the level of certificates held, however, given the occupational structure of the industry it is likely that up to half of the men with certificate-level qualification have a certificate IV gained through a formal apprenticeship. Others, including most of the women, are more likely to have the certificate III or lower qualifications required for their occupations. Relatively few people in the industry have degree qualifications (110 men and 31 women hold bachelor degrees), and the numbers of people with postgraduate qualifications is even smaller, at 1 per cent of all employees.
Amongst those who do hold a post-school qualification, the majority have undertaken studies in the field of engineering and related technologies.

Table 3.22: Field of post-school qualification, certificate level and all qualification levels – forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Field of study</th>
<th>Certificate-level qualification</th>
<th>All qualification levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering and related technologies</td>
<td>602</td>
<td>717</td>
</tr>
<tr>
<td>Architecture and building</td>
<td>141</td>
<td>145</td>
</tr>
<tr>
<td>Management and commerce</td>
<td>36</td>
<td>94</td>
</tr>
<tr>
<td>Agriculture, environmental and related studies</td>
<td>36</td>
<td>84</td>
</tr>
<tr>
<td>Field of study not stated</td>
<td>14</td>
<td>71</td>
</tr>
<tr>
<td>Food, hospitality and personal services</td>
<td>40</td>
<td>43</td>
</tr>
<tr>
<td>Creative arts</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Natural and physical sciences</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Education</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Society and culture</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Health</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Field of study inadequately described</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Information technology</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Mixed field programs</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Not applicable (no qualification)</td>
<td>0</td>
<td>1,151</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>891</strong></td>
<td><strong>2,405</strong></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

A significant number of workers also have skills in the architecture and building field, with smaller numbers having studied management and commerce, and agriculture, environmental and related studies.

The relatively low level of formal skills and qualifications within the forestry, paper and wood products industry is reflected in the wage structure for the industry.
While more than half (52 per cent) of the men employed in the sector earn $1,000 per week or more, only 12 per cent of women earn this level of income. The proportions earning less than $1,000 per week in this sector (48 per cent of men and 88 per cent of women) are significantly higher than amongst the other resource sectors. The proportion of higher-income earners, that is, those earning over $2,000 per week, is relatively small, at 6 per cent of men and 1 per cent of women.

The incomes generated in this sector generally contribute to the upkeep of families, with only 15 per cent of workers in the sector living singularly or not in a family unit.
Table 3.23: Family composition – forestry, timber and paper, Latrobe Valley region

<table>
<thead>
<tr>
<th>Family composition</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple family with no children</td>
<td>24.1%</td>
<td>30.1%</td>
<td>24.9%</td>
</tr>
<tr>
<td>Couple family with children</td>
<td>56.4%</td>
<td>46.7%</td>
<td>55.2%</td>
</tr>
<tr>
<td>One parent family</td>
<td>3.5%</td>
<td>7.6%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Other family</td>
<td>1.1%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>14.9%</td>
<td>14.5%</td>
<td>14.9%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

More than half of all workers (55 per cent) live in a couple family with dependent children. A further quarter (25 per cent) live in a couple family without dependent children. The proportion of single-parent families, while low at 4 per cent is higher than the average for the Latrobe Valley region.

**Workforce summary**

This distinctive workforce has the following features:

1. There is an important layer of workers with professional forestry- and timber-related qualifications.
2. The sector employs a substantial number of non-credentialised workers, both male and female.
3. The proportions of employees earning more than $1,000 a week is lower than the natural resource sectors and higher for those earning less than $1,000. Nonetheless, there are pockets of relatively high wage levels, as at the largest paper mill in the area.

**Opportunities and challenges**

The forestry, timber and paper sector is large and a major part of the Latrobe Valley region economy. It is a major employer in the area and an important source of financial benefit to the LGAs in the region. If steps are not taken to guarantee the supply of the resource, then there is likely to be a gradual and continual decline in the availability of this resource. Such a trajectory will impact on job
levels, with the social consequences of displacement. It would also affect the economic future of the region.

The resource

The resource comprises plantations and native forest. In the context of transition, particularly towards a low-carbon future, the use and exploitation of the native forests in Australia have been subject to a robust and at times polarising debate. In addition, plantations compete with other sectors for land use. Indeed a major challenge for the region is maintaining the existing resource, which has diminished in recent years, as a result of bushfires and incursions that have reduced working forest areas (plantation and native), particularly for environmental reasons. This depletion has occurred despite the Gippsland Forestry Agreement (2000) between the state and federal governments. The Agreement aimed to provide long-term stability to the forest and forest industries. It acknowledged the desirability of expanding both hardwood and softwood plantations in the Gippsland region and of encouraging investment in sawlog plantations through such initiatives as Plantations for Australia the 2020 Vision. In reality, the working forest area of the Latrobe Valley region, and Gippsland more broadly, continues to diminish.

In addition to securing the existing resource, expanding the plantation area within the Latrobe Valley region would be the most sustainable and secure means to ensure the future of the sector, and even enable it to expand over the next two to three decades. Such plantation expansion could be complemented by private farm forestry.

The Victorian Government has identified land in the region that may be suitable for conversion to plantations (Map 3.5).

Map 3.5: Potentially plantable area by productivity class

Source: Cameron and Meynink (2008)
While there is suitable land (excluding the Macalister Irrigation District) for increased plantation growth, the sector faces concerted challenges. These include water usage and stress, land availability, plantation quality and transport, as recognised by Cameron and Meynink in 2008:

Over recent years the Gippsland forest and forest products industry has undergone a transition from being initially processor constrained to one that is now substantially resource constrained for all classes of wood and log grades except low grade material. It is difficult to make up shortages in log types from a wood class with different logs from other classes. In the context of this report, plantation grown hardwood sawlogs cannot currently substitute for native forest sawlogs and sawmills cannot profitably produce sawn timber from existing plantation grown sawlogs.

Increased fuel costs have resulted in substantial increases in haulage cost, shrinking the effective wood supply catchment within economic haulage of mills and further exacerbating future supply capability.

Developing plantations to supply appearance grade sawlogs to replace catchment forest sawlogs presents many challenges.

(p. 47)

The major issue that faces the forestry and timber/paper sector in the Latrobe Valley region in the short term is to secure the wood fibre supply to:

a) ensure that the region’s existing commercial operations continue

b) enable the sector to expand and pursue new markets.

Both the softwood and hardwood supply will face challenges over the next decade. As has already been described in this report, the softwood plantation area has not been expanded over the past 10–15 years. This is partly because softwood species are less attractive to investors as they require a minimum of around 27 years in the ground before harvesting. Plantation eucalypt, on the other hand, can be harvested at around 15 years of age for pulp logs and chips. The industries in the region that are reliant on plantation softwood are therefore already operating at capacity. In other words, there is no further plantation softwood volume available to be processed. In addition to this, companies such as
Carter Holt Harvey are facing a significant reduction in wood supply as a result of HVP’s losses in the 2009 Victorian bushfires.

The region’s hardwood mills face a similar supply challenge. Timber mills such as Gunns’ Heyfield mill is also operating at sourcing rather than production capacity, processing 70 per cent of mountain ash harvested in Victoria with the remaining 30 per cent not suitable for their product range. While the area of eucalypt plantations across the state has grown over the past decade, there are a number of key points to consider when discussing the potential for plantation eucalypt to be grown for sawlogs:

a) Plantation eucalypt has different characteristics to that growing in native forests, making it is more difficult to dry and saw into high-grade timber. This is because eucalypt species can take over 80 years to mature to the point of being suitable for sawlog production (Cameron, 2005).

b) The majority of existing eucalypt plantations have been grown for the pulpwood market, and as such the eucalypt species that have been chosen are not good sawlog species (Pöyry Management Consulting, 2011).

c) Existing eucalypt plantations have been pruned in accordance with a pulpwood regime, and it is too late now to convert to the sawlog pruning regime which must commence within the first four years (Pöyry Management Consulting, 2011).

d) The majority of eucalypt plantations are located in the ‘green triangle’ in the south-west of the state. Even if these plantations could be converted to sawlog production, the cost of transporting the logs to the Latrobe Valley region is unviable.

Some hardwood plantations are being grown to produce sawlogs, including some plantations owned by HVP in the Latrobe Valley region. Heartwood Plantations is also investing in research and development to find ways of growing eucalypt suitable for sawlog generation. While at present the hardwood mills of the region, and indeed Australian Paper at Maryvale, can source wood fibre from harvestable public native forest, there is the potential for this resource to become increasingly scarce in the future. Securing an appropriate supply of wood fibre for these mills, and particularly for Australian Paper, is absolutely critical for the future of the sector in the region.

One of the most significant limitations to the survival of the forestry and timber/paper sector, as well as to any expansion that the sector hopes to see in
the future, is the lack of capital investment in long-rotation plantations. On the one hand, this reflects a market in which investors are primarily seeking short to medium-term returns. On the other hand, investors are deterred by the political volatility and diminishing social licence surrounding the sector, and forestry in particular. Key representatives in the industry figures express frustration at the portrayal of the forestry and timber/paper sector in the media, particularly in relation to the environmental impact (or benefit) of the sector:

It should be a good news story – we’re replacing coal with renewable resource.

      (LVSAFOR01)

and

If the only source of your knowledge of the native forest timber industry was The Age, you would probably not have a really good view of it. [The public] don’t look at the facts enough [so we’re] always on the nose.

      (LVSAFOR02)

The politicisation of the sector and its industries is undeniable. This politicisation has the effect of severely handicapping the sector in terms of the willingness of government to support its expansion, not only in relation to increasing the fibre source but also in terms of developing its biofuel potential:

[The Clean Energy Future] legislation was not made around science or reasoning or anything like that... Forget the fact that ash in Victoria is [harvested] extremely sustainably. Forget the fact that we are absolutely trying to drive every value we can out of what we do. Forget the fact that what we produce is a waste product that can be used for very clean, efficient electricity generation. The fact is that [the exemption of native forest wood waste] is a political decision.

      (LVSAFOR02)

The lack of political will to support the sector contributes to the legitimisation of community opposition to both existing and future plantations. While different arrangements apply to plantations and native timber, many in these localities do not differentiate between the two. There is the sense within the sector that plantations have become a forgotten asset of the Latrobe Valley region, undervalued by both local government and the community:
We lose [land] every year... [We have] social pressure or community pressure or government pressure to give up land... We had to give up land for the Strzelecki walking track, we had to give up 8,000 hectares for an environmental attack on us four years ago... Nobody really wants trees in their backyard.

(LVSAFOR03)

This oversight was clearly illustrated in the extensive media comment that followed the Black Saturday bushfires of 2009. HVP suffered the single largest financial loss of the fires, with 10 per cent of its 160,000 hectare estate destroyed. The subsequent replanting of the area cost the company around $50 million. Yet the losses suffered by HVP were not included in the media coverage of the fires, or even in the extensive media estimates of damage to property. This example offers a telling insight into the community, media, and political attitudes towards the forestry and timber/paper sector. While such reports do not necessarily indicate either locality or political views, they are part of the mix that creates the impression that plantations were not impacted upon in any long-term sense by the fires.

The question of a social licence for forestry and its related industries is in fact a question of survival. In the absence of a political decision to protect supply and to stimulate national demand for the products, the sector is at risk of disappearing from the Latrobe Valley region entirely:

[The fires are] only part of the reason for the decline of the industry... Unless we get a change of federal government or [change in] federal government attitude, our industry will just disappear completely... I was at a meeting yesterday, with the heads of a lot of timber companies from right across the whole industry, who were saying that unless we have some massive changes, in ten years [time] we won't be here as an industry.

(LVSAFOR03)

The forestry and timber/paper sector in the Latrobe Valley region is represented by a number of strong businesses, some of which seek to adopt appropriate environmental standards into their operations. They are embedded in their local communities, with a very high proportion of their workforce sourced from within the Latrobe Valley region.
Value-adding

The future of the forestry and timber/paper sector in the Latrobe Valley region will be in part determined by the willingness and capacity of businesses to adopt new technologies and access new markets, particularly in the area of value-added timber and paper products. Australian Paper, for example, is currently undertaking a feasibility study with the support of the Victorian Government on the possibility for a de-inking plant to be established at the Maryvale mill site. There is hope that the de-inking plant will be capable of converting 80,000 tonnes of paper waste, primarily sourced from the Melbourne metropolitan region, into 50,000 tonnes of paper product. Such projects have the potential to improve the linkage between metropolitan Melbourne and Gippsland, while also increasing the production capacity of businesses such as Australian Paper. Recycling material to form new products offers opportunities for the manufacturing sector more widely.

Value-adding has been the focus of developed countries overseas, and particularly Canada, where significant amounts of investment have been committed to research and development into technologies to produce high-value wood-derived products. Two cases illustrate opportunities in this area of value-added wood processing:

1. Chantiers Chibougamau.

Chantiers Chibougamau is a family-owned company located in Northern Quebec. The sawmill has an annual capacity of 320,000 cubic metres of softwood lumber. In addition to its standard softwood lumber products, such as studs, the company manufactures value-added engineered wood products such as laminated beams, spans and columns for industrial and commercial uses. It employs 600 employees, and is fully integrated from logging operations and silviculture to sawmilling and manufacturing of engineered wood products.

In 2011, the company began manufacturing the largest cross-laminated timber panels in the world. FP Innovations assisted the company develop the product, the specifications and the manufacturing processes. The supply of wood fibre comes from the Crown lands, guaranteed by the Quebec Government. The investment for the new CLT facility was in the magnitude of CAD$10 million. Financial support was received from the Quebec Solidarity Fund (established by the Quebec Federation of Labour to maintain and to develop employment in the Province of Québec (see Fonds de Solidarité FTQ, 2011).
2. Fortress Paper

Fortress Paper is a Vancouver (B.C.) based company with facilities in Germany, Switzerland and Canada. In 2010 Fortress acquired Fraser Papers Inc. with its hardwood bleached Kraft pulp mill located at Thurso, Quebec. This closed mill was reopened by converting the former market pulp for cellulose production and developing a dissolving pulp process. The production is used to make viscose, a material used in the textile industry; mostly sold on the Chinese market. In addition, the company has built a cogeneration plant adjacent to the mill, using the steam produced at the recovery boiler as well as hog fuel burnt at the conventional steam boiler. This electricity is sold into the electricity grid.

Biomass

One possibility for the forestry industry is to consider the use of biomass for fuel and energy production. The bioenergy potential of the Latrobe Valley region is well established (Climate Works Australia, 2011). The region’s forestry and timber/paper industries are a major potential source of fuel for a bioenergy generator, and so too are the region’s agribusiness activities. What the region needs now are firm business cases to move the sectors closer to capitalising on their bioenergy potential.

The existing cogeneration activities of both of the forestry and timber/paper and agribusiness sectors demonstrate the capacity and suitability of the region for additional bioenergy production. The case for commercial production of bioenergy is further strengthened by:

a) existing power infrastructure in the region
b) existing volume of wood waste, including 100,000 tonnes from HVP
c) potential contribution of the region’s agricultural and horticultural waste (Monash University Gippsland and Gippsland Regional Plan, 2010)
d) proximity of the region to Melbourne, enabling the possibility of transporting Melbourne wood waste to a bioenergy generator.

A detailed assessment is needed to determine precisely how much biomass waste could be made available for such a project by combining wood waste from the region’s mills and harvesting operations (potentially including native forest), agricultural and horticultural waste from the region, and wood waste collected
from Melbourne. There may be issues surrounding the nature of the chemicals contained in wood waste from Melbourne, which may or may not prevent it from being burned in a generator. More detailed analysis is also needed to determine whether agricultural and horticultural waste could be processed in the same generator as wood waste. Of course, should the plantation area within the Latrobe Valley region be expanded, this would increase the volume of wood waste available for bioenergy production in the future. Internationally, there has been much work in this area, and there are now well-developed and commercially viable processes in place. Nonetheless, the first step in realising such opportunities is to map out the resource and ensure that there is a guaranteed and sustainable source available.

To illustrate the process of support that does seem to work, attention should be given to developments outside Australia. The United States Department of Energy (USDE), for example, plays a critical role supporting research and development of renewable sources of energy. Such sources are derived from different types of ‘fuels’ such as water or solar as well as geothermal power, but also from plants, such as forest harvesting waste, timber and agricultural crops. Different types of industrial or domestic residues are also considered a potential source of biomass (for the scale of such production in the United States, see Appendix 2).

The USDE is engaged in a program aimed at supporting industrial-size pilot or experimental plants, specifically designed to produce energy from different sources of biomass. Most of the output that comes from the processing of the biomass is either ethanol (corn) or biodiesel (agricultural residues). The USDE is also developing other bio-sources, such as the forest biomass and the industrial residues from the forest products industry. One of the main challenges is to make sure that the supply of forest biomass is sufficient and sustainable. Towards this end, the National Renewable Energy Laboratory is currently estimating the available stocks of forest biomass potentially available to produce fuels such as ethanol and biodiesel and to supply electricity-generating plants. The laboratory has also estimated that the prospective biofuel production from forest biomass is five gallons of ethanol for every tonne of biomass. This is based on a recovery rate in the magnitude of 50 per cent and a conversion factor of about 62 (NREL, consulted April 2, 2012). All states have now been mapped in terms of their bioenergy potential.

There are a range of possibilities for the sector. Two examples of innovation and development in North America (although not necessarily immediately transferrable) are:
1. Product: Cellulforce

In February 2012, Cellulforce, a joint venture of Domtar, a manufacturer of printing paper in North America, and FP Innovations, a national consortium of forest products research and development centres and universities closely linked with the industry all over Canada, began the first industrial-scale facility to produce nanocrystalline cellulose (NCC). The facility is adjacent to Domtar’s uncoated free sheet paper mill in Windsor, Québec. A number of scientists from FP Innovations and universities have worked on the development of nanotechnology products for many years. They received financial support from both the provincial (state) and federal governments. This support and the associated research and design was critical for the commercial development of the technology.


In March 2012, Ameresco started up a 20 megawatt cogeneration facility that uses 325,000 tonnes of biomass, comprising a large biomass-fuelled steam cogeneration plant and two other smaller units. The project was supported by the United States Department of Energy under its Energy Savings Performance Contract program. This contract provided finance for the design, construction, operation, fuel and maintenance of the facility for 20 years (USD$795 million). The plant is expected to generate USD$944 million worth of savings during the 20-year period (Environment News Service, 2012). The surrounding forest will source residues from forest, woodchips and bio-derived fuels.

Policy complications and bioenergy

One possibility would be to promote bioenergy capacities as part of the Latrobe Valley region energy hub. A bioenergy project in Southern NSW may provide a precedent for how bioenergy could be commercially generated using wood waste. South East Fibre Exports (SEFE) is pioneering a bioenergy project at its Jews Head timber mill site on Twofold Bay. They estimate that the plant will be capable of producing 31,000 megawatt hours of electricity per year from 51,000 tonnes of wood waste (SEFE, 2012). The plan is to feed the majority of this into the local power grid. However, at this point the SEFE project will not be classified as renewable energy under the Commonwealth Government’s Clean Energy Future plan (2011) because the mill sources its wood fibre from harvestable public native forest. Under the plan, native forest biomass is not classified as ‘renewable’, even where it is the waste left over from legitimate timber milling processes. Only bioenergy power plants that use plantation waste will qualify for large-scale
generation certificates, under the Clean Energy Future package. The scheme improves the commercial viability of such bioenergy plants. Unless there is a change to Commonwealth legislation, bioenergy production in the Latrobe Valley region would have to forego government assistance. This may question the commercial viability of such a project in the region. By way of example, the Heyfield timber mill produces a large quantity of sawdust as a by-product of its milling operations. The mill presently generates enough energy from the sawdust to meet 85 per cent of its electricity needs. However, the volume of sawdust would be large enough to power 10,000 homes if a commercial generator was established on or near the site. Such a generator would not attract funding assistance as a renewable energy source under the Clean Energy Future plan, because the Heyfield mill processes almost only wood from native forests.

Ownership

One difficulty that the industry faces relates to the question of ownership. The past has shown that acquisitions by Australian and international companies take place for a variety of reasons. It is not always the case that owners are committed to the comprehensive expansion and support of plants in the region; rather, the acquisition may be part of a broader product and financial rationalisation that can lead to the eventual closure of plants in the region, while supporting and developing sister plants elsewhere. In addition, where a locality is reliant on a major employer, as has been the case in the generating industry, oil and gas, and forestry, then the withdrawal of that employer from the area can have devastating social and economic impact on the region. For many in the Latrobe Valley region, the period of privatisation has indicated what can happen.

The ownership patterns and the relative narrowness of the industry base, in relation to supply, processing and distribution, mean that it is unlikely that there will be industry investment in bio-facilities and related arrangements. Since the supply is not guaranteed, it is hard to imagine investment from within or from without. Nonetheless, the current owners of the paper mill and the timber mills have invested heavily in biomass technology that is either innovative (often with government funding support) or directly relevant to production and the broadening of the production process, such as paper recovery and production equipment. The overall investment over the last 10 years for the paper mill is in excess of $610 million (Australian Paper, 2010; Nelson, 2012). The problem for the industry is to have a waste processing plant located in the region, near the main mills and the plantations, as well as accessible to the rail and road infrastructure. The question is how this can be engineered and by whom.
The purchase of capital equipment can be a problem in this sector. For loggers most of the heavy equipment necessarily comes from outside Australia. These purchases are necessary but can come with difficulties in relation to maintenance and repair. For this reason, it is not unusual for logging contractors to employ their own mechanics. These factors, together with the cost of machinery and the availability of skilled drivers and loggers, as well as the physical pressures of such work, can constitute barriers to entry into the sector.

Skills issues

As with other sectors, the workforce is largely male and ageing. It is also skilled in the specific areas of work germane to forestry, logging, and processing. Thus, there is a long-term barrier to expansion within the sector as a result of availability of replacement labour as these older workers leave. Given the competing demands from elsewhere it is unlikely that many will be readily drawn to this sector of employment, in part explaining the current shortages.

Remuneration levels are one of the barriers for attracting workers into the sector. The proportions of workers earning less than $1,000 per week in this sector are significantly higher than the natural resource sectors under examination. This has implications for recruitment into the sector, along with the perception that the industry does not offer long-term career opportunities, as was the case in the past. This prospect obviously has implications for the futures of the mill towns and related communities in the region.

Considerations

Opportunities

- Expansion and diversification: The Latrobe Valley region is already home to a network of key businesses in forestry/paper/timber that are well established and either considering or under the appropriate circumstances would consider expansion and diversification within the region.

- Improvements to value-adding through new technology: Internationally significant amounts of investment have been committed to research and development into technologies to produce high-value wood-derived products, with the prospect of access to new markets.

- Bioenergy/biomass for fuel and energy production: The bioenergy potential of the Latrobe Valley region is well established. The region’s forestry and
timber/paper industries are a major potential source of fuel for commercially viable bioenergy generator(s) and related biofuel innovations.

- Recycling material to form new products: Different types of industrial or domestic residues and by-products are also considered a potential source of fuel/fibre for bioenergy generation and other uses. Projects of this nature have the potential to improve economic linkages between metropolitan Melbourne and Gippsland.

**Barriers**

- Supply limitations: The Latrobe Valley region’s forest and plantation resources are limited and declining, further undermined by problems of capital and land availability.
- Limited prospects for capital investment: The investment climate does not provide the level of stability required for long-term resource security. This partially stems from changes in licencing arrangements and logging quotas, which may or may not be influenced by environmental concerns and opposition. The problem is not demand but supply and the conditions that would secure investment in relation to supply. While there is a relationship between investment and demand, in the face of declining supply, purchasers of timber and related products have little choice but to look elsewhere for these goods.
- Diminishing social licence: The politicisation of the sector and its industries is severely handicapping the sector in terms of government willingness to support its expansion, not only in relation to increasing the fibre source but also in terms of developing its biofuel potential.
- Ownership and acquisition: In an industry characterised by a few large employers the issue of ownership is critical. It affects the flow of investment into the sector, continued operation of specific plants, and the willingness to expand their product base.
- Narrow industry base: Ownership patterns limit the access of non–industry specific enterprises, such as bio-facility operators, into the sector. Complementing this feature is the way resources are locked into a particular production chain by time-specific contracts.
Priorities

Priority 3.8: Develop plans that identify the forest resource for the area and set out the parameters for the sustainable use and replenishment of the resource. The Department of Sustainability and Primary Industries is currently carrying out a study of the resource, its use and future prospects. This report should provide the base for the LGAs to develop an integrated approach to the resource, and for the Victorian and Commonwealth Governments to revisit the Gippsland Forestry Agreement. Anything short of this will result in a declining industry, with companies and owners withdrawing from the area and the workforce experiencing the brutality of an ad hoc further contraction of the industry.

Priority 3.9: Develop a supported program to establish at least one biomass facility in the region, one that can use forest waste (at least from plantations), metropolitan timber waste and agricultural waste. A number of proposals have been considered already but none has gone beyond a feasibility study. It will be necessary to review capacity (megawatt capacity), location, incentives to build and operate such a facility and ownership. Such a facility would provide the focus for developing transport infrastructure, promoting low-carbon measures in an energy region, promote employment in relation to a sustainable practice (thereby reinforcing the transport sector in the industry) and contribute to knowledge development and good practice in the industry. It also has the potential of benefiting more than one sector: agriculture and agribusiness as well as energy production.

Priority 3.10: With timber manufacturers, develop feasibility studies for a program of investment for further value-added timber products in the region, either through or associated with the existing timber facilities. The industry is well aware of the possibilities for value-added production, and governments have been supportive of moves in this direction, if not in Gippsland then elsewhere in the country. As part of a process of securing the future and encouraging a balance between domestic markets and export ones, collaborative ventures should be encouraged, modelled on international experience.

Priority 3.11: With other sectors, attention should be given to promotion and support of focused research and development programs that build on sector-based research capacities for the region as a whole. It is the case
that elsewhere in the world the shift of this type, from an industry that exploits
the resource in a non-sustainable way via woodchip and related products to
one that is focused on sustainable and low-carbon value-added processing,
requires a partnership between the industry, governments, NGOs and
education and research facilities.
Part D: Agriculture (agrifood and agribusiness)

Background

A major focus of economic activity in the Latrobe Valley region is agriculture, comprising both primary production and secondary processing. Across the area of greater Gippsland, this sector generates around $1.3 billion of fresh produce and processed goods per year (DPI, 2012). The agriculture sector is distributed across the entire Latrobe Valley region (Map 3.6). Horticulture is concentrated in Baw Baw Shire, where a number of hydroponic farms are located. Wellington Shire is home to the Macalister Irrigation District, which comprises 53,000 hectares of irrigated farmland (Gippsland Regional Plan Control Group, 2010). Dairy and broadacre farms occupy the dryland pastures of the region as well as the surrounding Gippsland area. Overall, the region’s farmland is shifting eastwards, as land prices in the west rise under pressure from urban sprawl and subdivision. Food and dairy processing plants are concentrated in or near the main townships, particularly in Morwell, Warragul, Traralgon and Maffra. A significant food-processing cluster is located to the east of the area in East Gippsland. South Gippsland is also home to three major dairy processing plants. While commercial fishing is a significant industry in East Gippsland and has some potential for expansion in South Gippsland and the Bass Coast area, it is limited within the immediate Latrobe Valley region.

Map 3.6: Agricultural land use in Latrobe Valley region

Source: DPI (2011)
Primary production

The Latrobe Valley region was founded as a farming region when European settlers transformed the landscape in the mid to late 1800s. Farming has remained a constant even as new industries have risen to the fore and the local economy has evolved, at times tumultuously. The most recent data indicates that today there are as many as 6,500 farms across the whole of Gippsland, of which 1,700 are dairy farms (DPI, 2012a; GippsDairy, 2011). In the immediate Latrobe Valley region there are 511,295 hectares dedicated to agriculture, representing 31.4 per cent of the region’s total land area (ABS, 2006). Across Gippsland, dairy and broadacre farming (beef, sheep, and grain crops) account for as much as 90 per cent of agricultural land use (Table 3.24).

Table 3.24: Number of farms, Gippsland 2004-05, by industry classification

<table>
<thead>
<tr>
<th>Industry</th>
<th>Gippsland no.</th>
<th>%</th>
<th>Victoria no.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef cattle farming</td>
<td>1,419</td>
<td>42</td>
<td>7,924</td>
<td>25</td>
</tr>
<tr>
<td>Dairy cattle farming</td>
<td>1,415</td>
<td>42</td>
<td>6,199</td>
<td>19</td>
</tr>
<tr>
<td>Sheep-beef cattle farming</td>
<td>179</td>
<td>5</td>
<td>2,255</td>
<td>7</td>
</tr>
<tr>
<td>Sheep farming</td>
<td>108</td>
<td>3</td>
<td>3,790</td>
<td>12</td>
</tr>
<tr>
<td>Vegetable growing</td>
<td>76</td>
<td>2</td>
<td>793</td>
<td>2</td>
</tr>
<tr>
<td>Livestock farming n.e.c.</td>
<td>56</td>
<td>2</td>
<td>112</td>
<td>0</td>
</tr>
<tr>
<td>Horse farming</td>
<td>20</td>
<td>1</td>
<td>366</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>74</td>
<td>2</td>
<td>10,611</td>
<td>33</td>
</tr>
<tr>
<td><strong>All industries</strong></td>
<td><strong>3,347</strong></td>
<td><strong>100</strong></td>
<td><strong>32,050</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Where estimated value of agricultural operations is more than $5,000
Source: ABS (cited Mackinnon and Phillips, 2008: 2)

Dairy is Gippsland’s highest-value agriculture industry. Gippsland accounts for over 30 per cent of Victoria’s dairy output and 23 per cent of national milk production (Dairy Australia, 2012). It represents around half of Gippsland’s agricultural commodities (Mackinnon and Phillips, 2008). The Latrobe Valley region has long been synonymous with dairy farming and milk production, with dairy farms established in the Strzelecki Ranges as early as 1875. Dairy farming in the east of the region expanded when the Macalister River irrigation scheme commenced in 1919, replacing what had formerly been dryland farming country (Maffra and District Historical Society Inc., 2012; McAlloon, 2010). Today the Macalister Irrigation District remains the major irrigated dairy region in Gippsland (DPI, 2012a). Although recent years have been profitable for the dairy farmers of the Latrobe Valley region, it is an industry that has faced a number of serious challenges over the past decade, including drought and volatility in world milk prices. And, while the dairy industry of the Latrobe Valley region is primarily export-focused, there is concern
amongst farmers and industry figures that the viability of the region’s dairy farms could be severely undermined by price wars between Australia’s major supermarket chains (Makeig, 2011; Chester, 2011).

The other major focus of primary production in the Latrobe Valley region is broadacre farming. This farming is Gippsland’s second-largest agricultural industry (Shearer et al., 2011). It accounts for around half of Gippsland farms, although many of these farms are small with an average cash income of $35,000 a year. Around 60 per cent of operators on these farms work off-farm to supplement their wages (Mackinnon and Phillips, 2008: 9). Around 42 per cent are beef cattle farms, with beef slaughter accounting for 25 per cent of the total value of all agricultural production. Beef farmers in the broader Gippsland region contribute to a quarter of the state’s beef production, with much of their high-value grass-fed meat exported to Asia (DPI, 2012). Hobby farms account for some of the region’s beef production, with beef cattle proving more manageable for part-time farmers than dairy. The contribution of so-called hobby farms to regions such as the Latrobe Valley is often underestimated and is the topic of a University of Melbourne study currently being conducted in conjunction with Agribusiness Gippsland (see Bennet, 2012).

Across the Gippsland area, horticulture produces a wide range of fruit and vegetables including mushrooms, potatoes, tomatoes, apples and berry fruit. Other crops include lettuce, broccoli, asparagus, beans, capsicum, sweet corn, cauliflower and cucumber. Some of these crops have a long-standing history in the area. The township of Thorpdale in Baw Baw Shire is known as the ‘Heart of Potato Country’. During the 1950s, Italian migrants to the area played an integral part in establishing Thorpdale’s potato industry (Fletcher, 1993a). Combined with Mirboo North, today Thorpdale’s farmers produce 80 per cent of Victoria’s brushed potatoes for six months of the year (Travel Victoria, 2012). The town hosts the annual Thorpdale Potato Festival over the Labour Day weekend in March. Other townships specialising in particular crops include Korumburra in neighbouring South Gippsland, where 70 per cent of Australia’s snowpeas are grown (South Gippsland Shire Council, 2012).

The overall role of horticulture in the Gippsland agriculture sector is relatively small, comprising 76 farms or only 2 per cent of the region’s farms or in 2004–05. In the same period it accounted for 6 per cent of the value of all agricultural production. However, the farms that are engaged in horticulture are often large enterprises, with 28 per cent of horticulture farms earning an annual income of $1 million or more (Shearer et al., 2011). While the overall trend has been to produce and market fresh vegetables, there has been an increase in the quantity of value-
added processing that takes place in Gippsland. The major horticultural farm in
the Macalister Irrigation District has also incorporated basic food processing into its
operations (Text box 3.3). The horticulture industry across the Latrobe Valley region
supplies both domestic and international markets.

<table>
<thead>
<tr>
<th>Company name: Covino Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business type: Horticulture (vegetables) and secondary processing</td>
</tr>
<tr>
<td>Location: Longford (Wellington LGA)</td>
</tr>
<tr>
<td>Facility: 3,500 acres of farm and 8,000 square metre processing facility</td>
</tr>
<tr>
<td>Employees: Around 180-200 permanent, 20-30 seasonal. Expected to grow to around 250 over 2012 (Chester, 2012). Employees are usually from Seaspray, Sale, Stratford and Maffra areas.</td>
</tr>
<tr>
<td>Covino Farms are a family-owned and run business that moved to Longford from Silvan in 1993. Their operations are twofold. They are primary producers, growing a range of vegetables on their 3,500 acre property. They also shred, slice, mix and bag their vegetables on site to create ready-to-eat meals and salad products. Covino Farms use their own fleet of trucks to deliver their products to wholesalers, retailers and restaurants across Victoria, South Australia and up the Eastern seaboard (Covino Farms, 2012).</td>
</tr>
</tbody>
</table>

In 2006, Covino Farms received a grant through the Commonwealth Government’s Food Processing in Regional Australia Program (FPRAP). Valued at AU$200,000, Covino Farms used the grant to establish a vegetables processing line on their Longford property (Woodhouse, 2006). Their processing facility is 10,000 square metres in size and uses advanced technologies including vision sizing to consistently sort and pack the vegetables (Covino Farms, 2012).

Text box 3.3: Covino Farms

While the bulk of the Latrobe Valley region’s primary production is dedicated to commodities such as milk, beef and vegetables, it is complemented by a growing number of farms specialising in niche products. The region is home to an expanding range of gourmet cheeses, organic fruit and vegetables, venison, and other niche or gourmet produce. The Latrobe Valley region also supports a growing viticulture industry and several award-winning microbreweries. Of particular note is the growth in organic milk production from the Latrobe Valley region. The region is now the stronghold of Australia’s organic dairy industry, producing 80 per cent of Australia’s certified organic milk (True Organic, 2012).
Further, there is evidence of a shortage of supply, with advertisements from the Organic Dairy Farmer’s cooperative appearing regularly in local newspapers appealing to more dairy farmers to make the transition to organic farming practices. The Latrobe Valley region is also a source of certified organic beef, as well as beef and other meats produced through non-certified organic farming practices. Certified organic fruit and vegetables are grown in the region and in the surrounding areas of East and South Gippsland. Unlike organic dairy and meat products, there is currently no company or brand built around Gippsland-grown organic fruit and vegetables.

Since the 1990s, the farming sector has been forced to restructure and adapt to new market conditions as a result of the deregulation of agriculture and the globalisation of trade (see Gray and Lawrence, 2001; Tonts, 2000). This period saw structural adjustment schemes implemented across Australia to encourage marginal farmers to exit the sector (Vanclay, 2003). In the Latrobe Valley region, the most significant restructuring occurred with the deregulation of the dairy industry in 2000. This deregulation was a major factor in the dairy farm consolidation that took place across the region (Gippsland.com, 2003). It is a trend that has continued to the present day, with farming in the Latrobe Valley region increasingly the domain of larger family or corporate farm businesses, replacing the traditional model of smaller family-owned and operated farms (Shearer et al., 2011).
**Company name: Flavorite Hydroponic Tomatoes**

**Business type:** Hydroponic tomatoes  
**Location:** Warragul (Baw Baw LGA)  
**Employees:** Almost 200 (Ballinger, 2012)

Flavorite Hydroponic Tomatoes in Warragul is Victoria’s largest producer of hydroponic tomatoes, and one of the largest in Australia (Mole, 2011). Established in 1992, Flavorite has grown significantly over the past decade to become a major employer for Warragul residents (Flavorite, 2012). According to one consultant’s report, Flavorite is at the ‘very leading edge’ of hydroponics technology and integrated food production (cited in Baw Baw Shire, 2008: 4).

In addition to tomatoes, Flavorite also grow Lebanese cucumbers and capsicum. Their tomatoes are sold across Victoria and NSW, as well as seasonally in Queensland and Western Australia. Opportunities for export are emerging in Singapore, Malaysia, Thailand and Hong Kong (Mole, 2011).

Flavorite is planning a $30 million expansion of their Warragul facility, which would see their workforce swell to over 300 people (Ballinger, 2012). The state government has committed $460,000 in funding, which will be directed towards water efficiency project works. Securing a reliable and relatively inexpensive water supply is pivotal to the company’s expansion plans. In February 2012, the state government committed AU$460,000 in funding to assist Flavorite in reducing its consumption of town water by 64 per cent. The water efficiency project will involve the construction of a 50 mega litre covered dam for rainwater harvesting and the installation of a water filtration system needed for the hydroponics operation.

Flavorite has benefited from local government support for the expansion of the hydroponics industry in Baw Baw Shire. Local government assistance to the industry has involved commissioned research, providing assistance to existing companies such as Flavorite and others considering establishing hydroponics food production operations in the region. The local government aims to develop Baw Baw Shire as a hydroponics centre ‘large enough to attract quality support companies such as equipment manufacturers and suppliers plus technical support industries’ (Baw Baw Shire Council, 2008: 6).

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**Text box 3.4: Flavorite Tomatoes**

Today the best-performing farms in economic terms within the Latrobe Valley region are those that have adopted this larger-scale corporate structure, particularly those engaged in horticulture and who combine growing the products with processing (Shearer et al., 2011). Covino Farms as well as Flavorite Hydroponic Tomatoes in Warragul (Text boxes 3.3 and 3.4) are examples of farms that have successfully adopted this business model.

**Food and dairy processing**

Food and dairy processing activity adds significant value to the Latrobe Valley region’s agricultural and horticultural produce. Meat and dairy production alone contribute $1.13 billion to the local economy (Gippsland Regional Plan Control Group, 2010). The majority of this comes from the 14 dairy processors within the
Gippsland region, which produce both commodities for export and further processing such as milk powders and dairy ingredients, and final products for retail sale including cheeses, UHT milk and yoghurt. Major dairy manufacturers located within the immediate Latrobe Valley region include Murray Goulburn in Maffra (see Text box 3.5), Lion Dairy and Drinks (formerly National Foods) in Morwell, Fonterra in Darnum, and Longwarry Food Park in Longwarry. Other major dairy manufacturers in the Gippsland area include Burra Foods in Korumburra and United Dairy Power in Poowong. There is also a number of significant dairy manufacturers located just outside Gippsland who source their milk from the region’s farms, such as Parmalat in Rowville and Five:am in Carrum Downs.

### Company name: Murray Goulburn Co-operative Limited

- **Business type:** Dairy processing
- **Location:** Leongatha and Maffra
- **Employees:** 450 Leongatha processing plant, 170 Maffra processing plant, 2,400 people on farm (Murray Goulburn, 2012; Davies, 2011)
- **Suppliers:** 1,118 dairy farms across the entire Gippsland region (Davies, 2011)
- **Ownership:** Wholly owned by its dairy farmers and suppliers
- **Products:** Dairy spreads, cream, powders, milk powders, UHT milk, blends (Murray Goulburn, 2011)
- **Farmgate value (Gippsland):** AU$400 million

Murray Goulburn’s (MG) operations make a significant contribution to the local, state and national economy. It is estimated that the total value of MG’s annual contribution to the local economy in the Latrobe Valley region is $1.125 billion (Davies, 2011). The co-operative is one of the largest contain exporters from the Port of Melbourne. MG is Australia’s largest dairy exporter, with markets in Asia, the middle East, USA and Central America (Murray Goulburn, 2011).

In 2006 MG received over AU$5.5 million in funding from Regional Development Victoria in support of two water recycling and energy projects at the Leongatha processing plant (RDV, 2012). The total cost of the projects was AU$36.7 million, with upgrades to the facility’s water recovery and re-use plant (Murray Goulburn, 2008). The water treatment plant upgrades included a biogas engine project, harvesting the biogas generated with the treatment plant and converting it to electric power for use at the facility (DFI, 2010).

The future of Murray Goulburn in the Latrobe Valley region is uncertain. In 2005 Murray Goulburn announced an AU$135 million upgrade to their Leongatha processing plant, to be carried out as part of a 10-year plan for the facility. However, the works have been put on hold indefinitely, with the co-operative needing to slash AU$100 million from their operating costs (Drury, 2012). There are also concerns surrounding the future of milk supply in the region.

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Text box 3.5: Murray Goulburn Co-op
Food-processing activities also add value to the region’s horticultural produce, beef cattle, and sheep, although these activities are far less developed in the Latrobe Valley region than dairy processing. Meat is processed at Radfords in Warragul, where production of certified organic meat has grown considerably in recent years (Radfords, 2012). Covino Farms have expanded their business beyond primary production with the addition of food-processing lines to produce salads and packaged vegetables. Pure Harvest in Drouin has become one of Australia’s largest manufacturers and distributors of natural and organic foods, with many of their products exported overseas (Pure Harvest, 2012). While they source some of their ingredients locally, they also process ingredients sourced from elsewhere in Australia and overseas. Of particular note, however, is the East Gippsland Food Growing and Processing Cluster located in and around Bairnsdale (outside the immediate Latrobe Valley region). Where value-adding in the Latrobe Valley region is focused on dairy, the East Gippsland Food Cluster represents a wider range of food-processing activities. Food processing in East Gippsland employs 7 per cent of the region’s workforce, compared to only 1 per cent in the Latrobe Valley region (East Gippsland Food Cluster Inc., 2011). Patties Foods is the largest processing company in the East Gippsland Food Cluster, employing over 500 workers at their Bairnsdale headquarters (Invest Victoria, 2011). The company makes frozen processed savoury foods using locally sourced beef under the brands of Four’N Twenty, Herbert Adams and Patties. They also produce frozen desserts sold under the brands Nanna’s, Creative Gourmet, and Chefs Pride. Other companies in the cluster include Bonnacord Ingram, Vegco, Dennison Foods and Riviera farms.

While across Gippsland the food and dairy processing is confident of experiencing growth, the food and grocery manufacturing industry is predicted to contract across Australia by the year 2020. Regional communities are amongst those expected to be hardest hit by the contraction, and there are also likely to be associated job losses in agriculture (see for example Australian Food and Grocery Council, 2011). Food and dairy processing in Gippsland and across Australia is dominated by multinational companies, subjecting the industry and its workforce to global trends and pressures. At present, the pressures on the industry include a highly concentrated retail market, the strong Australian dollar, labour costs, rising energy prices and volatile commodity prices (Australian Food and Grocery Council, 2011). At worst, it is predicted that by 2020 more than a third of the industry’s nationwide workforce in food and grocery manufacturing could lose their jobs. Despite their relative strength, food processors in the Latrobe Valley region are not immune to these industry trends. Dairy manufacturers such as Lion Dairy and Drinks, which employs 190 people at their Morwell site, are as much affected by the milk price war as are the individual dairy farmers (Latrobe City
Council, 2009a; Makeig, 2011). Thus, the Latrobe Valley region is competing within a volatile global market to both retain its current food and dairy processing activity, and to attract further activity into the region.

Overview of the sector

The agriculture sector (including food processing and manufacturing) in the Latrobe Valley employs 5,607 people (ABS, 2006), representing approximately 9 per cent of employment in the Valley.

Table 3.25 Employment by industry subsector – agriculture, Latrobe Valley region

<table>
<thead>
<tr>
<th>Industry of employment</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, nfd</td>
<td>97</td>
<td>39</td>
<td>136</td>
<td>2.4%</td>
</tr>
<tr>
<td>Bakery product manufacturing</td>
<td>99</td>
<td>132</td>
<td>231</td>
<td>4.1%</td>
</tr>
<tr>
<td>Dairy cattle farming</td>
<td>1,443</td>
<td>820</td>
<td>2,263</td>
<td>40.4%</td>
</tr>
<tr>
<td>Dairy product manufacturing</td>
<td>434</td>
<td>146</td>
<td>580</td>
<td>10.3%</td>
</tr>
<tr>
<td>Deer farming</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>0.1%</td>
</tr>
<tr>
<td>Food product manufacturing, nfd</td>
<td>21</td>
<td>11</td>
<td>32</td>
<td>0.6%</td>
</tr>
<tr>
<td>Fruit and tree nut growing</td>
<td>40</td>
<td>32</td>
<td>72</td>
<td>1.3%</td>
</tr>
<tr>
<td>Fruit and vegetable processing</td>
<td>13</td>
<td>17</td>
<td>30</td>
<td>0.5%</td>
</tr>
<tr>
<td>Grain mill and cereal product manufacturing</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>0.1%</td>
</tr>
<tr>
<td>Meat and meat product manufacturing</td>
<td>167</td>
<td>46</td>
<td>213</td>
<td>3.8%</td>
</tr>
<tr>
<td>Mushroom and vegetable growing</td>
<td>239</td>
<td>125</td>
<td>364</td>
<td>6.5%</td>
</tr>
<tr>
<td>Nursery and floriculture production</td>
<td>64</td>
<td>62</td>
<td>126</td>
<td>2.2%</td>
</tr>
<tr>
<td>Oil and fat manufacturing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other crop growing</td>
<td>25</td>
<td>3</td>
<td>28</td>
<td>0.5%</td>
</tr>
<tr>
<td>Other food product manufacturing</td>
<td>62</td>
<td>19</td>
<td>81</td>
<td>1.4%</td>
</tr>
<tr>
<td>Other livestock farming</td>
<td>44</td>
<td>42</td>
<td>86</td>
<td>1.5%</td>
</tr>
<tr>
<td>Poultry farming</td>
<td>35</td>
<td>28</td>
<td>63</td>
<td>1.1%</td>
</tr>
<tr>
<td>Seafood processing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Sheep, beef cattle and grain farming</td>
<td>839</td>
<td>438</td>
<td>1,277</td>
<td>22.8%</td>
</tr>
<tr>
<td>Sugar and confectionery manufacturing</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>0.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,633</td>
<td>1,974</td>
<td>5,607</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing
Over half the agricultural workforce is located in the dairy sector, covering farming and processing, and the next concentration of employment is in sheep, beef and grain farming at 22.8 per cent of the agricultural workforce. While the sector is not as gendered as other sectors, at 65 per cent men, it is still dominated by male employment.

The occupational structure of the industry is concentrated around farming, with men and women represented in more or less equal proportions.

<table>
<thead>
<tr>
<th>Occupation (ANZSCO 06)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers and farm managers</td>
<td>59.29%</td>
<td>58.32%</td>
</tr>
<tr>
<td>Farm, forestry and garden workers</td>
<td>11.93%</td>
<td>13.22%</td>
</tr>
<tr>
<td>Factory process workers</td>
<td>8.67%</td>
<td>7.23%</td>
</tr>
<tr>
<td>Road and rail drivers</td>
<td>2.22%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Mobile plant operators</td>
<td>2.17%</td>
<td>0.31%</td>
</tr>
<tr>
<td>Specialist managers</td>
<td>2.14%</td>
<td>1.14%</td>
</tr>
<tr>
<td>Food trades workers</td>
<td>2.03%</td>
<td>0.67%</td>
</tr>
<tr>
<td>Automotive and engineering trades workers</td>
<td>1.77%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Engineering, ICT and science technicians</td>
<td>1.18%</td>
<td>1.70%</td>
</tr>
<tr>
<td>Skilled animal and horticultural workers</td>
<td>0.93%</td>
<td>0.72%</td>
</tr>
<tr>
<td>Inadequately described</td>
<td>0.82%</td>
<td>0.46%</td>
</tr>
<tr>
<td>Other clerical and administrative workers</td>
<td>0.62%</td>
<td>0.31%</td>
</tr>
<tr>
<td>Sales representatives and agents</td>
<td>0.62%</td>
<td>0.46%</td>
</tr>
<tr>
<td>Hospitality, retail and service managers</td>
<td>0.59%</td>
<td>1.14%</td>
</tr>
<tr>
<td>Machine and stationary plant operators</td>
<td>0.53%</td>
<td>0.21%</td>
</tr>
<tr>
<td>Other labourers</td>
<td>0.51%</td>
<td>0.15%</td>
</tr>
<tr>
<td>Chief executives, general managers and legislators</td>
<td>0.48%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Cleaners and laundry workers</td>
<td>0.42%</td>
<td>1.29%</td>
</tr>
<tr>
<td>Design, engineering, science and transport professionals</td>
<td>0.37%</td>
<td>0.57%</td>
</tr>
<tr>
<td>Business, human resource and marketing professionals</td>
<td>0.31%</td>
<td>0.31%</td>
</tr>
<tr>
<td>Electrotechnology and telecommunications trades workers</td>
<td>0.31%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Storepersons</td>
<td>0.28%</td>
<td>0.15%</td>
</tr>
<tr>
<td>Managers, nfd</td>
<td>0.25%</td>
<td>0.15%</td>
</tr>
<tr>
<td>Labourers, nfd</td>
<td>0.23%</td>
<td>0.21%</td>
</tr>
<tr>
<td>Office managers and program administrators</td>
<td>0.17%</td>
<td>0.62%</td>
</tr>
<tr>
<td>Sales assistants and salespersons</td>
<td>0.14%</td>
<td>4.70%</td>
</tr>
<tr>
<td>Construction and mining labourers</td>
<td>0.14%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Almost two-thirds of workers in the sector (59 per cent) work as farmers and farm managers, with a further 12 per cent employed as farm, forestry and garden workers and approximately 8 per cent employed as factory process workers. Men and women have relatively even representation in each of these occupations, and while women are somewhat more likely to take on sales roles than men, and men are somewhat more likely to work as drivers, mobile plant operators and food tradespersons than women, overall there is less occupational gender segregation within the sector than in the other three sectors.

This pattern is also evident in the age structure of the sector’s workforce.
While the proportion of men is higher amongst workers aged 20 to 34, the proportion of women is higher amongst those aged 35 to 54. Overall, the age structure of the industry is relatively normally distributed.

This is an industry where many work long hours on average.

Table 3.27 Average weekly hours worked by sex – agriculture, Latrobe Valley region

<table>
<thead>
<tr>
<th>Hours Worked per week</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 41</td>
<td>61.6%</td>
<td>35.7%</td>
</tr>
<tr>
<td>35–40</td>
<td>22.9%</td>
<td>22.1%</td>
</tr>
<tr>
<td>&lt; 35</td>
<td>15.6%</td>
<td>42.2%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

The agricultural sector has a high incidence of longer-than-average weekly hours, with 62 per cent of men, and 36 per cent of women working 41 hours or more per week. This may be due to the seasonal nature of the industry. But unlike the oil and gas or coal and electricity sectors, long hours are not necessarily reflected in the
monetary compensation received.

This sector does not have a highly credentialised workforce, although in many respects it is a multiskilled workforce.

Table 3.28: Highest level of school completed by sex – agriculture, Latrobe Valley region

<table>
<thead>
<tr>
<th>Highest year of school completed</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 or equivalent</td>
<td>22.7%</td>
<td>33.7%</td>
<td>26.6%</td>
</tr>
<tr>
<td>Year 11 or equivalent</td>
<td>20.3%</td>
<td>22.1%</td>
<td>20.9%</td>
</tr>
<tr>
<td>Year 10 or equivalent</td>
<td>30.2%</td>
<td>25.2%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Year 9 or equivalent</td>
<td>13.5%</td>
<td>10.1%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Year 8 or below</td>
<td>10.8%</td>
<td>6.1%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Did not go to school</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Not stated</td>
<td>2.4%</td>
<td>2.6%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

While most workers in the sector did attend high school, almost a quarter of the men (24 per cent) and 16 per cent of the women did not complete Year 10. A slightly higher proportion of women than men in the sector completed Year 12 at high school.

Not surprisingly, this is a sector where a limited number hold post-school qualifications.

Table 3.29 Post-school qualification by sex – agriculture, Latrobe Valley region

<table>
<thead>
<tr>
<th>Post-school qualification: level of education</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate degree level</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Graduate diploma and graduate certificate level</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Bachelor degree level</td>
<td>4%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Advanced diploma and diploma level</td>
<td>5%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Certificate level</td>
<td>28%</td>
<td>11%</td>
<td>22%</td>
</tr>
<tr>
<td>Level of education inadequately described</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Level of education not stated</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Field of qualification</td>
<td>All qualification levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural and physical sciences</td>
<td>1.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information technology</td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering and related technologies</td>
<td>10.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture and building</td>
<td>2.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture, environmental and related studies</td>
<td>9.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>1.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>2.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management and commerce</td>
<td>3.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Society and culture</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative arts</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food, hospitality and personal services</td>
<td>2.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed field programs</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of study inadequately described</td>
<td>0.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of study not stated</td>
<td>4.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td>60.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overseas visitor</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: ABS, 2006 Census of Population and Housing

While women were more likely to complete Year 12, more than two-thirds of women in the sector hold no formal post-school qualifications. Amongst the men, 57 per cent hold no post-school qualification. The most commonly held post-school qualification for both men and women in the sector is a certificate-level qualification, with only 19 per cent of men and 16 per cent of women holding a higher-level qualification.

Post-school qualifications were varied, although clustered around the physical sciences.

Table 3.30: Field of post-school qualification, all qualification levels – agriculture, Latrobe Valley region

Within the sector, the most common field of post-school qualification was engineering and related technologies, followed closely, and unsurprisingly, by agriculture, environmental and related studies.
The low level of recognised skills and qualifications in the sector is reflected in the average weekly incomes of workers. The agricultural sector has a small proportion of workers who report negative or nil income on a weekly basis. The median income in the sector, for both men and women is $400–$600 per week, and it should be noted that less than 20 per cent of people in the sector earn more than $1,000 per week.

Opportunities and challenges

The agriculture sector is large and complex. While its origins in the region run deep, it is a sector influenced by global and domestic market trends, demographic and technological change, and climatic and land-use patterns. On the surface, it would appear that the mood within the agriculture sector of the Latrobe Valley region is for the most part positive. Key businesses in primary production including Covino Farms and Flavorite are setting the benchmark for what is possible for farming within the region. The statistics for the dairy industry are impressive, in terms of both its contribution to national milk production and the volume of dairy products currently exported overseas. Smaller niche producers are contributing to the creation of a Gippsland ‘brand’ associating the region with quality in food, dairy and wine. The East Gippsland Food and Processing Cluster holds promise for the scope of food processing within the Latrobe Valley region.

With appropriate investment and industry policies, the food and dairy processing industries have the potential to strengthen the local economy and provide employment for a wide range of skilled workers. In the case of dairy and beef, primary production is currently estimated to contribute $1.4 billion to the Gippsland economy. Meat and dairy processing is estimated to contribute a further $1.1 billion to the economy (Gippsland Regional Plan Control Group 2010, p. 83). Local government recognises the value-adding potential of the Latrobe Valley region and is committed to attracting further processing activity, particularly large-scale food manufacturing processors (Latrobe City Council, 2011). Diversifying the food-processing activities beyond dairy poses a challenge, given that horticulture only accounts for 2 per cent of farms in Gippsland (ABS, cited in Mackinnon and Phillips 2008). Vegetable growing in the immediate Latrobe Valley region is particularly limited, although expansion of the hydroponic industry in Baw Baw Shire and intensification within the Macalister Irrigation District may increase the availability of locally grown produce for processing.

From a strategic perspective, the Latrobe Valley region is focusing its efforts on establishing food or dairy processing clusters in particular locations (Gippsland Regional Plan Control Group, 2010). The cluster concept is based on the East
Gippsland Food Growing and Processing Cluster, which is considered to demonstrate the way forward for the agriculture sector in Gippsland.

The cluster has been successful in attracting and retaining food processors in the East Gippsland region, and in improving the connection between local farmers and these processors. The success of the cluster is largely attributed to its collaborative approach and organisational structure (Text box 3.6).

<table>
<thead>
<tr>
<th>East Gippsland Food Growing and Processing Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="FoodCluster logo" /></td>
</tr>
<tr>
<td><strong>Key business members:</strong></td>
</tr>
<tr>
<td>Frats Farms, Patties Foods, One</td>
</tr>
<tr>
<td>Harvest/Vegco, Dennison Food Manufacturing, Bonaccord Produce, Bulmers Family Farms, Kerton Farms.</td>
</tr>
<tr>
<td><strong>Other members:</strong></td>
</tr>
<tr>
<td>East Gippsland Shire, Gippsland East Local Learning and Employment Network, East Gippsland TAFE.</td>
</tr>
<tr>
<td><strong>Executive officer:</strong> Dr Nicola Watts</td>
</tr>
<tr>
<td><strong>Business type:</strong> Strategic project</td>
</tr>
<tr>
<td>(food growing and processing)</td>
</tr>
<tr>
<td><strong>Project cost:</strong> $273,000</td>
</tr>
<tr>
<td>- $33,000 from cluster members</td>
</tr>
<tr>
<td>- $50,000 from the East Gippsland Shire</td>
</tr>
<tr>
<td>- $190,000 from the State Government of Victoria (Field, 2011)</td>
</tr>
<tr>
<td><strong>Project aims:</strong></td>
</tr>
<tr>
<td>- Sustainably grow the East Gippsland agribusiness sector</td>
</tr>
<tr>
<td>- Identify opportunities for increased productivity through innovation and supply chain synergies</td>
</tr>
<tr>
<td>- Develop the workforce capability (Rural and Regional Committee, 2011)</td>
</tr>
<tr>
<td><strong>Current sector employment (East Gippsland):</strong></td>
</tr>
<tr>
<td>Over 1,000 full-time equivalents, or 7% of East Gippsland region total workforce (East Gippsland Food Cluster Inc., 2011)</td>
</tr>
<tr>
<td><strong>A major focus of the East Gippsland Food Growing and Processing Cluster is education with an aim to recruit the sector’s future workforce. Executive officer Dr Nicola Watts believes that education is a significant limitation and an opportunity for the sector, with a need to target younger people right down to primary school age. Education programs and initiatives should aim to introduce young people to the various career pathways within the sector, improve their appreciation of the sector’s importance to the region, and inform them about the range of possibilities within the sector (Rural and Regional Committee, 2011).</strong></td>
</tr>
<tr>
<td><strong>The Cluster also recognise that it is important to determine alternative business models for the farming industry, away from the traditional family-owned and operated model. What are the different farm ownership models that could emerge in the future (Rural and Regional Committee, 2011)? Alternative models need to be understood and promoted in order to ensure that young people are provided with exciting and innovative places to pursue a career.</strong></td>
</tr>
<tr>
<td><strong>Current sector economic output (East Gippsland):</strong></td>
</tr>
<tr>
<td>$154 million (East Gippsland Food Cluster Inc., 2011)</td>
</tr>
</tbody>
</table>

Text Box 3.6 East Gippsland Food Cluster

There are considerable opportunities for agriculture in the Latrobe Valley region. As noted by KPMG (2011) the region has a higher share in agriculture, forestry and fishing (8 per cent) than for Victoria as a whole. Nonetheless, over the next 30 years it is expected to display modest growth, in Baw Baw and probably
elsewhere in Gippsland. However, there are labour shortages. Over the decade from 1996 there was a decline in agricultural employment, but by 2012 this is now a sector that is experiencing labour shortages. Nonetheless, agriculture in Gippsland has the potential to become a food bowl for Victoria and Australia more generally (Climate Works Australia, 2011; SED Consulting, 2010). Steps have already been taken in this direction, reflected in the number of major milk processors in the region, many from outside Gippsland and in some cases Australia. The LGAs have taken steps to promote agriculture, as a niche production area (Baw Baw), as a food hub (East Gippsland) and as a major dairy producer area (South Gippsland and Wellington. Thus, the Latrobe Valley region is at the centre of a major agricultural hub, including an agrifoods hub.

Despite these optimistic developments, agriculture faces a range of challenges. These include resources, employment levels and skills, and a range of barriers in relation to the processors.

Resources
There are two major resource issues facing the agriculture sector in the Latrobe Valley region: land and water supply. First, land usage, and the competing interests on this usage, are creating problems for agriculture. There is concern surrounding the absence of adequate planning laws to protect the region’s prime agricultural land. Questions are raised as to whether the state government is providing sufficient direction to local councils, as well as whether local councils are capable of making decisions in the long-term interests of the region:

You get the local government that makes the decision to actually re-zone part of that land supply for development; that’s making a decision for the here and now. Nobody actually seems to be making a decision for five years, 10 years, 20 years, 50 years out.’

(LVSASCENARIO002)

This is not a recent phenomenon in the Latrobe Valley region. Competition for land use has threatened farmland across the region for several decades. However, the underlying issue remains the same: land planning strategies that make a firm commitment to the preservation of land for agricultural purposes have been absent. Baw Baw LGA is caught in the middle of these cross-cutting pressures, with no clear and unequivocal guidelines or compensation for taking one decision or another.
Not only is the sector competing for access to land and water with each of the other three sectors addressed, it is also increasingly competing with urbanisation, particularly in the Baw Baw LGA. One of the major barriers to the realisation of these opportunities is the chaos and relative anarchy in relation to land usage in the region. This problem is clearly brought out in the western boundary of the region where urbanisation and agriculture compete for land in a potentially destructive way, probably for both urban development as well as agricultural use. The LGA is at the centre of this competition, without the capacities or resources to address the problems in a long-term and responsive way for the benefit of the locality as a whole rather than the specific concerns of a range of competing interests, food processors, agricultural producers, developers, long-term residents in the area and newcomers.

Here the encroachment on prime agricultural land is a major concern for farmers. In this western belt of the Latrobe Valley region, there is considerable pressure on farmland as the metropolitan edge of the greater Melbourne conurbation begins to encroach upon areas such as Drouin and Warragul. With this urbanisation comes temptations for farmers, with the selling-off of agricultural land to developers an attractive financial proposition:

You don’t want [developers] to be buying up good rural properties... except if you [own] the farm and you’re selling it off when you want to retire... Then you’d want the developer to come in and buy the land.

(LVSASCENARIO01)

The second major resource issue facing the sector in the Latrobe Valley region is water. There is enthusiasm for ‘intensification’ of agriculture, as the way forward for primary production, in broadacre and dairy farming as well as in horticulture and cropping. Intensification of production is dependent on a range of factors, including technology and labour, but one of the most important factors is water supply. There is reasonable confidence that climate change will not adversely affect the rainfall of the region, and that indeed the Latrobe Valley region and Gippsland more broadly are well positioned to become a future food bowl for Victoria and Australia (Climate Works Australia, 2011; SED Consulting, 2010). Historically, however, water shortages and climatic extremes have taken a considerable toll on the region’s farming community. Despite the confidence of bodies such as Climate Works Australia, farmers and industry bodies remain concerned that water will be a limiting factor for the region’s agricultural and horticultural capacity. Murray Goulburn is concerned that a lack of access to appropriate water volumes will prevent dairy farmers across Gippsland from
growing and expanding their businesses (Davies, 2011). But it is not only primary production that depends on an ample water supply. Food and dairy processors require vast volumes of water in their operations. At present, agriculture in the Latrobe Valley region is essentially at capacity in terms of what can be produced from the water available. Many farmers in the Latrobe Valley region have no further water available to them to expand their operations:

This year we used 100 [per cent] or possibly over of our water allocation, which means that that’s it; we cannot grow anymore as a business. We spent the last two years trying to buy water entitlements from outside the areas, but the system is very difficult to [work within].

(LVSAAGRI05)

The Gippsland Region Water Supply Strategy aims to provide greater certainty of water supply for industries in the region (see DSE, 2011). Competition between the resources and urban development for the available water supply remains the underlying issue. In particular, there is considerable competition for water use from the power generation and oil and gas industries, which limits the availability of water for alternative use in the agriculture sector. Projects such as the Gippsland Water Factory in Latrobe City LGA add to the region’s water supply through recycling. Murray Goulburn’s Leongatha plant is also constructing a water recycling facility. Other water savings could be made through infrastructure upgrades across the region’s water delivery systems (DSE, 2011a). The Macalister Irrigation District (MID) has been identified as an area where dairy and horticulture activity can be intensified. However, any intensification is largely dependent on more water entering the system. Significant savings could be made through upgrades to the MID open-channel systems, with considerable volumes presently lost through leakage and seepage, evaporation and outdated measurement and irrigation delivery systems. It is estimated that these factors contribute to the loss of around 32 per cent of all water used in the MID each year (Gippsland Regional Plan Control Group 2010: p.125). Southern Rural Water has plans to modernise the system in order to reduce water loss. Without these steps, it is likely that the district will face an uncertain future with consequent impacts on dairy production in the region (Davies, 2011).

Securing the agricultural workforce of the future

Agriculture faces ongoing labour shortages. These are of three types. First, there is a problem ensuring entry into the sector, particularly in relation to dairy and less so broadacre farming. Second, there is an ongoing problem in relation to relief work
and the seasonal fluctuations of the industry. Third, there is evidence that the sector often finds it hard to recruit specialist technical staff.

The first problem relates to entry into the sector, in ways that ensure that there is a generational replenishment of the workforce, particularly in relation to the dairy industry. The sector is experiencing major problems attracting youth into the workforce. As stated at one workshop:

I think agriculture as a whole – because we’re price takers, and I think … no matter whether we’re a boutique industry or a larger family operation, unless there’s some major changes, we will not have a farming sector, because the youth aren’t coming through to replace these farmers, and why would they?

(LVSASCENARIO02)

This issue was the topic of a submission by the East Gippsland Food Growing and Processing Cluster to the Rural and Regional Committee on the capacity of the farming sector to attract young people. Representatives of the cluster raised their concern that too little is being done to educate students at primary and secondary level about the range of jobs that the agriculture sector offers, the avenues available to reach these jobs and the benefits that the sector provides to the community (Rural and Regional Committee, 2011). Where young people do want to enter the agriculture sector, and farming in particular, those who do not already have a farm in the family to inherit are typically unable to afford to break into the market. This sentiment was echoed in the scenario workshops:

There are [members of the] younger generation that actually want to get into farming. [But] they’re finding it harder and harder, because a lot of farms are owned by corporations. They don’t have the capital behind themselves to actually purchase the farms, which they are wanting to [do].

(LVSASCENARIO02)

The traditional methods of entry have been via inheritance, via share-farming arrangements and via assistance, for example in the ‘soldier settlement’ arrangements after the two World Wars. However, increasingly there are barriers to such entry, not least the increasing size of herds, which then require major capital investment in the herd and the facilities from the outset. As a contributor to one of the scenario workshops stated:
I was a dairy farmer owner and operator, and we were fourth generation farmers. We actually got out of the industry, my partner and I, because it de-regulated, and we were only milking about 145, 150 cows at the time, and we could see the future; that that was not enough to cover our expenses off into the future, when we did some five and ten-year planning. It was going to be too small. It turns out, we were probably right. So, we got out of farming.

(LVSASCENARIO02)

The diminishing pool of labour is also a problem for farmers requiring on-farm relief workers. Further, there is anecdotal evidence that some farmers are facing significant difficulties in finding appropriately skilled staff to service electrical equipment. There are dairy farmers, for example, who rely on Swedish milking technology for which only one person in the whole of Australia has the knowledge and skills to service the equipment. A similar issue was raised in one of the scenario workshops:

A fellow dairy farmer... has three rotary cow sheds, all with automation in them. His automation broke down and it took him four days to get somebody there to fix it. Now, in four days his cows have dropped from doing 5,000 litres back to 1,000. So what has he done? He has pulled all the automation out and put it in a shed, because unless we get a technologist who can service these things, what’s the point in having automation?

(LVSASCENARIO01)

Increasing the productivity of farmers in the Latrobe Valley region is therefore not as straightforward as simply investing in new or upgraded technology. Without the necessary skills or knowledge base, investment in such technology can prove a liability for some farmers and farm businesses.

As many reports have noted, there are also issues surrounding the labour pool to support any expansion in food or dairy processing. Some processors already have difficulty filling highly skilled positions. Others have a reliance on a casual workforce that may become problematic if new processors enter the region.
Processing and processors

There are a number of key barriers to growth in the food and dairy processing industries in the Latrobe Valley region that must be considered. There are currently 14 milk processors in operation in Gippsland. As noted above they are owned by farmers cooperatives, international food-processing companies and family or similar ownership arrangements. In addition, there is comment in the region about the possibility of more processors entering the region (as it becomes a recognised dairy hub). However, based on the current circumstances, questions must be raised about the capacity of the region to support an expansion of this kind. In one workshop, it was stated:

[The company] is watching its milk supply go down. That is partly due to more competitors coming in, but also due to dairy farmers selling out and not being dairy farmers anymore. They're becoming boutique – rightly or wrongly – becoming boutique farms, or smaller and more intensive food producing, potentially, or agritourism.

(LVSASCIENARIO02)

These trends have also been observed in a number of reports (Mackinnon and Phillips, 2008: 9–10).

While the recent entry of processors into the region is quite marked, coupled with the concentration of ownership over time, there is also a prospect of oversupply. This would have a detrimental effect on the processing industry, the producers and the localities where the processors are located. Closure of a large processor in a relatively small town and away from the major conurbations would have disastrous effects on the social and economic wellbeing of these localities.

Transport infrastructure

Transport infrastructure is a problem. At present, food processors in the region are reliant on roads to transport their products for domestic consumption and export, with a major destination for companies such as Murray Goulburn being the Port of Melbourne. Accommodating additional product may be problematic:

It’s no good having a rejuvenated or really active product that you can’t get out of the place, or that you’ve got to [take] to the Port of Melbourne... [There] are really critical infrastructure elements that
aren’t there... which then hamstrings the [companies] that come into the area.

(LVSASCENARIO02)

There appears to be a very mixed, overlapping and damaging set of arrangements in relation to transportation of products. This is especially true of the dairy processing industry. To illustrate the scale of the problem, in at least one case, milk is collected from farms across Gippsland, transported into Melbourne for storage and distribution and then transported back into Gippsland for processing, and once the processed product is packed (with materials transported into Gippsland) it is transported back to the metropolitan area for further storage and distribution via retailers’ supply-chain networks to retail outlets (some of which will also be in Gippsland). Over time, these arrangements can (and probably will) become barriers to expansion and the stability of the industry, rather than opportunities, as may be the perception now.

Investment and its limitations

There has been considerable inward investment into the industry but limitations are now becoming evident. Expanding food and dairy manufacturing, for example, will place pressure on the region’s water resources, raising questions as to whether the current agricultural and horticultural output of the region is sufficient to support such an expansion. Energy supply is an issue, with a large proportion of Gippsland not supplied with domestic reticulated natural gas. The electricity distribution network in some areas is poorly equipped to accommodate additional lower voltage or high-voltage industrial development (Gippsland Regional Plan Control Group, 2010).

Each of these factors will limit the capacity of the region to attract investment, particularly the investment, necessary for food and dairy processing activities to be expanded. Some of the region’s major processors, including Burra Foods (Text box 3.7) and Radford meats have benefited from the government funding opportunities that are available in relation to technological innovation. However this is a relatively ad hoc process and as such constitutes a barrier to the more widespread and comprehensive development opportunities that are there. Investment in new value-adding technologies must remain a priority for the region going forward.
Company name: Burra Foods Australia

Business type: dairy processing
Location: Korumburra
Employees: 130 [Dun and Bradstreet, 2012]
Suppliers: 140 from across Gippsland region and Western Victoria [Burra Foods, 2011]
Ownership: Crothers family – 55% (Australia), Itochu Corporation – 45% (Japan)
Products: Natural cheeses, fresh milk concentrates, food preparations, specialty milk powders, fresh dairy products [Burra Foods, 2012]
Annual profit: AU$31.080,000 (2011) [Dun and Bradstreet, 2012]
Export: 26 countries across Asia, Europe, Middle East [Burra Foods, 2011]
Investment: In 2012 a $34 million expansion of Burra Foods' Korumburra facility was completed, funded primarily by Japanese port-owners

Text box 3.7 Burra Foods Australia

Without such support, it is not clear that investment into the industry would be forthcoming, unless targeted and focused arrangements are put in place to facilitate inward investment. Further, investment dollars are crucial to ensuring that the region remains technologically competitive.

The other side of investment and support for current operators is to secure inward investment into the area, from suppliers of current goods and services to the agriculture industry. Establishing and promoting some of the developments, such as food processing, is expensive, in relation to land acquisition, equipment and infrastructure. As dairy farms expand their production moving from 300 plus cows to 600 plus and in some cases 1,000 cows, the equipment cost became major. Not only must this machinery be acquired, it also must be serviced and maintained. In some cases, this may lead producers to consider parallel or backup arrangements.
to the most advanced technological facilities, at a cost. There is evidence that some of the resources for maintenance are limited by proprietary rights (often located outside Australia) and specific sophisticated technical skills. Transport, land availability, infrastructure arrangements and lifestyle factors can also limit the capacity of the region to attract enterprises to relocate to Gippsland.

Considerations

Opportunities

- Establishing food and/or dairy processing ‘clusters’: The cluster concept is based on the East Gippsland Food Growing and Processing Cluster, which is considered to demonstrate the way forward for the agriculture sector in Gippsland. This cluster has been successful in attracting and retaining food processors in the East Gippsland region, and in improving the connection between local farmers and these processors. The success is largely attributed to its collaborative approach and organisational structure. There is potential for a similar cluster in dairy or food production in the Latrobe Valley region, given the proximity and concentration of primary producers across Gippsland.

- Diversifying existing operations: The food and dairy processing industries have the potential to diversify through technological innovation, product diversification and opening up new and sometimes niche markets (e.g. organic foods).

- Using new farming techniques and technologies: The Latrobe Valley region is at the centre of a major agricultural hub that includes dairy and beef, vegetables and viticulture. There are opportunities for the sector to extend its activity and increase its workforce. Expansion of the hydroponic industry in Baw Baw Shire and intensification within the Macalister Irrigation District may increase the availability of locally grown local produce for processing.

Barriers

- Land access and usage: Competition in relation to land use is creating problems for agriculture. There is particular concern surrounding the
absence of adequate planning laws to protect the region’s prime agricultural land.

- Water access and usage: Water is critical for the ‘intensification’ of agriculture. It sets a limit to growth in primary production, in broadacre and dairy farming as well as in horticulture and cropping. At present, agriculture in the Latrobe Valley region is essentially at capacity in terms of what can be produced from the water available.

- Labour shortages: Agriculture faces ongoing labour shortages in a range of areas including relief work, seasonal work and specialist technical staff.

- Entry into the sector, particularly in relation to dairy and broadacre farming, is becoming more difficult due to increased capital costs (including land), declining profit margins and negative perceptions about farming as a career path.

- Transport infrastructure: At present, food processors in the region are reliant on roads to transport their products for domestic consumption and export, with a major destination for companies being the Port of Melbourne. There appears to be a very mixed, overlapping and inefficient set of arrangements in relation to supply and exit of products into, out of and across the region, particularly in dairy processing but also in other areas.

Priorities

**Priority 3.12: The skills and labour shortages that mark this sector require consideration of comprehensive outreach work to support the ageing workforce, facilitate generational change and encourage entry into the sector.** The skills shortages are twofold, involving mental and manual labour and long hours of work on the one hand and highly skilled and trained professionals on the other, in meat, vegetable and milk processing in particular. In addition, this is an industry where remuneration levels are not high, and while they may be close to the averages in the region, for many in the region, there is the draw of relatively high-paid jobs in other sectors and in other parts of Australia. To address this problem, organisations such as the Learning and Education Network, in conjunction with educational bodies, should be resourced to carry out outreach work within the industry and in schools.
Priority 3.13: Develop a plan that identifies the agricultural resource for the area and sets out the parameters for the sustainable use and protection of the resource. These aspects have been subject to study and review, by the Department of Primary Industry and others. It is time to move beyond review, and together with a consideration of other resources in the region, determine the areas that should be set aside for agricultural use. Such measures should be worked out in relation to coal overlays, water catchment arrangements and forestry use. This report should provide the base for the LGAs to develop an integrated approach to the resource, for the state and federal governments to develop a comprehensive and integrated approach to the resource. The absence of such a plan could result in a limited future for an industry that is on the cusp of becoming the principle food bowl of Victoria.

Priority 3.14: The farming industry is increasingly moving towards an intensification of mechanisation and equipment use, via technical development and economies of scale. There are, however, major deficits in relation to technical support, installation, maintenance and repair of such technology. Governments, and particularly the Commonwealth, should take steps to ensure that technical support and capacities are readily available to farmers and to the organisations servicing the sector. It may be that partnership arrangements are developed between equipment suppliers (the majority are internationally based) and financially supported and regulated maintenance servicing units (subject to proprietary rights). While there are complex proprietary rights and regulatory issues involved, it is also the case that in the absence of regionally based resources and capacities, there are limitations on how far the industry can move towards the utilisation of such equipment because the impact of any disruption as a result of breakdown is too great.

Priority 3.15: Develop a cooperative plan in relation to collection, storage and distribution of farm products, particularly in the dairy industry but also taking into account the requirements of other subsectors. This plan should include steps to develop the transport and logistics infrastructure projects that are critical to the future of Gippsland. The collection, distribution and storage of the agricultural resources across the region are unsustainable. These practices have developed due to historical reasons, particularly in the dairy industry, and they are factored into business operations via transport routes, product trading and auctions and specific niche requirements. However, they create the foundation for uncertainty about the future due to cost reasons, environmental concerns and regional aspirations. Solutions
could involve centralised collection and storage units, located in intermodal transport hubs and the like.

**Priority 3.16: Victorian and Commonwealth Governments should review and systematically promote the use of biomass and recycling facilities across the region in line with the National Renewable Energy Target Scheme.** As with the forestry sector, over the last few years there have been a number of proposals advanced, although none has gone beyond a feasibility phase. There are a range of options, some commercially developed, as is the case in North America. Some options are for individual farms while others are for clusters of farms. In addition, processing plants in both the dairy and vegetable subsectors have moved towards forms of recycling and cogeneration. The next stage is to determine a staged and modest move forward in the utilisation of these facilities in the region, developing and publicising business cases for the options available. Rather than focusing on innovative techniques and procedures, the emphasis should be on commercially tested and readily available facilities and technologies, adapted and attuned to the specific production processes of each unit.

**Priority 3.17: The appropriate government should provide support – expert advice, links, finance – to local government to promote the Latrobe Valley region as a ‘food hub’.** It is widely acknowledged within and about the industry that Gippsland as a whole has the potential to become a food bowl for Victoria and Australia more generally. Already steps have been taken to move in this direction, with the entry of major milk processors into the region, the development of the East Gippsland food hub, to capitalise and develop food related industry in this area of Gippsland, and by the presentation of Wellington as the location for niche food products. With fertile dairy and beef areas to the south and east of the region, the Latrobe Valley region is at the centre of a major food hub. To realise this, the following potential steps should be taken:

a. Ensure that there is an appropriate skills base for the industry, with the focus on skill and decent work. The Latrobe Valley region is also renowned for its skilled workers in the energy production and maintenance field and this should be the aspiration in the agricultural sector.

b. Locate and promote research and development in the area. There has been a long history of such support, but it is also necessary to
ensure that this continues as tertiary education institutions refocus and develop in the region.

c. Develop an awareness of agriculture as an occupational area of destination. Already steps have been taken in this direction by the regionally based agricultural and agribusiness organisations as well as the Learning and Education Networks, and related education and training bodies. Nonetheless, it is critical that this narrative goes beyond the traditional sectoral and political divisions that have dogged developments in this area.

d. Provide support for diversification, smaller farming operations and boutique producers. Some progress has been made, although these measures often become the focus of difficult debates about land use, the size of farming operations and so forth. A region-wide approach for an agreed set of principles is required as a matter of urgency.
Chapter 4: General considerations and priorities

The Latrobe Valley region has considerable potential. As the Directions for Latrobe Valley Transition: Discussion Paper (Latrobe Valley Transition Committee, 2012) has rightly pointed out, the Latrobe Valley region has ‘many competitive advantages including a skilled technical workforce and abundant natural resources’ (p. 4). Future economic success for the Latrobe Valley region (and Gippsland) will be built around these existing resources. The region is characterised by an embedded economy, one where the enterprises in coal and electricity, oil and gas, forestry and paper/timber, and agribusiness and agriculture become its strength. Enterprises in the four sectors define the region in ways that many other organisations operating in the region (such as aircraft manufacturing) do not. Hence, policy responses and considerations that recognise this embeddedness and seek to build upon them are likely to lead to sustainable economic activity in the long run. In turn, such an approach is likely to be less reliant on direct government support to ensure that enterprises remain embedded in the region.

However, as the sector analysis indicates, these competitive advantages face challenges. The extreme scenario presented as part of this research exercise presents us with the challenge of avoiding the worst-case outcome. An understanding of both the resources (strengths and limitations of each resource) and their value-adding potential is therefore vital. This focus allows a consideration of the competition between the sectors for labour, land usage and the use and exploitation of resources. It thereby allows a consideration of the opportunities for and barriers to investment, job growth and skill development, as well as questions relating to the governance that will enable a positive future for the region.

Many of the challenges facing the Latrobe Valley region are not dissimilar to those facing other regional areas of Australia or elsewhere. This is an era that is being shaped by the twin forces of urbanisation and increased international mobility of capital. While many regional areas seek to maintain viable economic bases, they are often disadvantaged and struggle to make effective transitions. In addition, governments have struggled to find solutions to the current problems faced by sectors and the region as a whole. The issues and considerations that face all in the region and those concerned with the region are twofold: across the sectors and across the region (and Gippsland). Each will be dealt with in turn.
Considerations across the sectors

**Consideration one:** Improving infrastructure that meets resource-based industry needs

The Latrobe Valley region is largely defined by the infrastructure arrangements along the spine of the three LGAs. There are urgent questions related to transport, focusing on the movement of goods and workers. In addition, the need for infrastructure improvement and development also includes communication (National Broadband Network), energy provision (e.g. natural gas supply), access to water, liquid- and hard-waste disposal facilities, as well as the provision of education, health, and housing.

There has been much debate about transport futures, and associated developments (such as the intermodal hubs in Morwell and Bairnsdale). Governments at all levels, and particularly the state government and the LGAs have reviewed and assessed possibilities, sometimes leading to feasibility studies. Lobby groups such as the C4G and the South and West Gippsland Transport Group have proposed both enhanced road systems and rail upgrades and extensions such as north–south rail links from the main Melbourne–Bairnsdale line to the Port of Hastings. But most proposals remain at the level of speculation and require major commitments from the Victorian Government in particular, as well as the Commonwealth, before they can be realised.

**Opportunities**

Without infrastructure improvement and development many opportunities facing these four sectors will not come to fruition.

First, as indicated in the sector reports, transport is a condition for major development and revitalisation of the regional economy. Improved transport infrastructure will enable:

- a rationalisation in the movement, storage and distribution of milk and milk related goods (into the region, around the region and out of the region)
- better movement of logs, wood and related waste and timber products (into, across and out of the region)
- the movement of coal products out of the region
the expansion of the horticulture subsector and easier access to urban markets

- greater movement of workers and citizens within, as well as into and out of the region.

Second, the promotion of a carefully integrated infrastructure program would provide for a focused revitalisation of the regional economy, as well as for the Gippsland economy as a whole. It would lay the foundation for a comprehensive policy approach to regional revitalisation and stimulate investment within and into the region.

One specific proposal that has been subject to considerable debate and is now almost ready for development is the proposed Global Logistics Precinct at Morwell. The proposal is to create an open-access intermodal freight terminal with access to both road and rail (Latrobe City Council, 2011a). While land has been reserved and land access to the rail has been secured, it is a project that illustrates many of the difficulties when promoting and developing the region. In the main, current businesses expressed satisfaction with the road network. When asked to elaborate, two matters were raised. First, and particularly in the timber industry, many spoke of the costs of double-handling from road to rail and from rail to road, citing figures of $2–$3 per cubic metre each time goods are handled. Second, many spoke of the absence of a dedicated freight line, and the delays associated with poor rail access to the Melbourne metropolitan area. These observations create the impression that the proposed development would not provide value to the region. The difficulty is that it is a project that is only one part of a possible solution to transport in the region.

The cost of the Global Logistics Precinct project is estimated to be $10 million and if built would lead to 150 new jobs, apart from the work involved in construction and commissioning the precinct. Latrobe City Council is attempting to secure funding from relevant state government departments (Latrobe City Council, 2011a). If successful, an open tender process would follow, inviting proposals from potential operators and developers.
The proposed precinct is projected to shift 29,950 x 60-foot containers in the short term and 20,000 tonnes per annum in bulk materials. Over the long term, it is projected that this would increase to 44,950 x 60-foot containers and 80,000 tonnes per annum in bulk material. If the movement of wood and related waste from the metropolitan area is promoted in relation to bioenergy facilities in the Latrobe Valley region, this could become a two-way movement of goods. Similarly, if a rationalisation of milk processing supplies and products is achieved then there are further possibilities for such a precinct.

As a project centred on rail, its value lies in the development of rail access to relevant port facilities. Given the absence of an appropriate rail network into the Port of Hastings (especially if this port became the preferred port for the Latrobe Valley region) or an unspecified alternative port, it does presuppose the expansion of the rail network in some way, with freight-line access to the Port of Melbourne or an alternative.

**Barriers**

One barrier to transport is the fragmented approach to policy formulation and development. So, while there are opportunities for sectoral consolidation and development, such proposals will be stillborn while transport is addressed in sector specific ways and in ways that do not enable public debate about timelines, business cases, social impacts (within the region and the metropolis). While
transport in relation to revitalisation is a tie breaker, at present it is an unmet necessary and sufficient condition for revitalisation.

A second barrier is the detrimental reliance of policy makers on the views of major business stakeholders in the region. Major employers and businesses in the region deal with the ‘here and now’. No major employer developed a case for a non-road transport set of arrangements that may provide benefit in the long term. The explanation is that these organisations can only deal with the short term and what is available. They each acknowledge when pressed that the road transport has long-term problems and ‘something will have to be done’. In contrast, planners and people concerned with infrastructure provision develop very specific arguments about these possibilities. Such a disjunction is unhelpful and inhibits planned infrastructure development.

A third barrier relates to the lack of capacity within the region to develop and prosecute an integrated and cohesive case for infrastructure development. The LGAs and GLGN have taken steps towards this end, so too have lobby and interest groups in the region (e.g. see Gippsland Regional Plan, 2010). However, they all face the problem of who ‘speaks’ for the region as a whole and to whom.

**Priorities**

4.1 **Commission the formulation and presentation of an integrated, public and costed infrastructure program (i.e. communications, transport, business and economic services) detailing required investment across the entire region.** The aim should be to develop a long-term strategy that views Gippsland as a whole. In so doing, decisions can be taken in relation to urbanisation and the identification of Latrobe City as the regional centre, while also recognising the significance to the region of each Gippsland LGA. Such an approach would provide support to the Gippsland Regional Plan (2010) and allow governments to address the specific transport requirements of each resource sector within a broader infrastructure program.

4.2 **As a matter of urgency, all levels of government should cooperate to develop and publicise the business case for transport alternatives.** Without such a program it is unlikely that the region will be able to develop an effective structural adjustment program. This is a long-term priority and should be developed over the next five years, so that the stages of development are agreed, the funding sources in place and the schedule for development in place.
Consideration two: Support for value-adding and diversification in the use and processing of resources within the region.

Flexible organisation networks characterise the pattern of industrial organisation in each sector. Many of the companies that provide direct services to resource-based industries are witnessing a decline in local demand for a range of reasons (changing contractual arrangements among lead companies, declining maintenance requirements, greater reliance of lead companies on suppliers from outside the region, etc.). While there may be uncertainty about the future within and across the resource sectors, a number of companies have taken steps to protect their business via diversification. This often means value-adding to the products. A number of energy contractor companies, for example, are successfully tendering for energy maintenance jobs in other parts of the country. In some cases, this involves sending regionally based workers to work on these jobs and/or bringing the work back to their Latrobe Valley workshops. In other cases, companies have sought to move into the training field by providing training to workers in other companies, occasionally in overseas locations. In yet other cases, companies have benefited from government financial support to develop innovative processes and equipment, thereby enabling a wider range of product output.

Opportunities

Regional industry in and around these resource sectors could be targeted for support. The task would be to enable and encourage small and medium businesses to focus on value-added products associated with the use of these resources. Already there are a range of contractors that supply technologies, services and goods to resource-based enterprises, processors, generators and others. In some cases, there are signs that enterprises are beginning to develop products that use the resource itself (in the case of coal these include fertiliser, energy, and related fuel uses). There are opportunities to help these companies diversify their operations. In some cases, this support may relate to the re-skilling of their workforce. In other cases, it may involve support for capital investments for the purchases of new equipment. The Victorian Government's recent funding announcement of the Hydro Australia Capability Improvement Project is an example of how such support can assist these sorts of companies in responding to changing market conditions. The funding aims to assist Hydro Australia, a traditional power generation contractor, in its bid to acquire new equipment so that it can better service a range of different industries (pulp and paper, oil and gas, marine and fisheries) (Ryan, 2012).
There are also opportunities to embed companies more effectively in the region via comprehensive value-adding of waste materials. Such initiatives as cogeneration (heat waste), biofuel/mass (timber and agriculture), carbon sequestration (timber and agriculture) are some of the possibilities. Such measures are already available to large companies (already well developed in paper, meat processing and dairy processing as well as some landfill facilities) but they are also potentially available to cluster of small and medium enterprises which may not have the resources necessary for installation and use on an individual basis. Supply of such material is potentially available across the whole region and broader Gippsland (forest, agriculture, industrial and household waste) as well as from the metropolis (timber and related product waste).

**Barriers**

Economic development assistance seems to be focused on the few larger enterprises in the region. In addition, this assistance has emphasised coal and electricity, and major developments such as the Gippsland aeronautics industry and the RAAF base in Sale. Other organisations have benefited from assistance in developing innovative sustainable practices, such as milk processors and timber and paper manufacturers. What this focus misses, however, is the myriad of contractors and supporting companies around these larger operators.

At present, there is an ad hoc unfocused movement of enterprises into and out of the area. In some circumstances, a chosen employer may be encouraged by governments to remain in the area, one interpretation of the support for GippsAero (Text box 4.1).
Company name: GippsAero

Business type: aircraft, aircraft Parts and auxiliary equipment, engineering services

Location: Traralgon

Employees: 110 (GippsAero, 2012)

Ownership: Mahindra Aerospace (India), acquired in 2009 (Mahindra, 2012).

Output: 20-25 aircraft per year (GippsAero, 2012)

Investment: The acquisition of GippsAero by Mahindra Aerospace enabled the company to plan for an expansion of its product line to four aeroplane types. GippsAero plans to produce the GA10 and GA18, with a Type Certificate already obtained for the GA18.

However, there are fears that GippsAero will be forced to relocate to another location if funding cannot be secured to support the upgrade of its facility.

GippsAero is seeking $4.24 million in federal government funding, including $3 million from the Regional Development Australia Fund (McRae, 2012). GippsAero believe that the expansion would create 50 further jobs at the facility and indirectly support another 200 jobs in the region.

Source: Kelly, 2011

Text box 4.1 GippsAero

However, there is little guarantee that such large and unbounded employers will stay in the region in the long run or will refrain from asking for further non-Damoclean support.

At the same time, many of the metropolitan and peri-urban based companies that supply and work with regionally based resource sectors may face expansion challenges due to the cost of land and zoning issues. Opening up the possibility of relocating and expanding their business closer to their major customers where the cost of production may be lower could be an attractive option to them. Indeed, some of the more successful vegetable producers and processors in the region have moved out from the peri-urban metropolitan area. Currently, however, such enticement seems to be undertaken in relatively unfocused ways by LGAs and by state departments and other agencies treating regional Victoria as a whole.

Because the value-adding of resource materials often occurs outside the region or overseas (timber, food processing, location of gas-fired power stations, packaging, and so on) it adds considerable transportation costs as material is moved out of
the region (principally to Melbourne) and then back again for final processing. In other cases, considerable manufactured product, such as packaging, is brought into the region, which is then sent back to Melbourne in its finished form. In other cases, new investment opportunities, where the region maintains certain competitive advantages, are lost to other parts of the state. The commissioning of the Mortlake gas-fired power station and the approval for AGL Energy to build a gas-fired power station in Victoria’s south-west has meant the Latrobe Valley region has missed out on clean energy transition opportunities and opportunities to value-add to the gas resources that are extracted from the Gippsland Basin.

Many companies, particularly in coal, oil and gas, are less embedded in the region than they once were. Often their reason for staying in the region has more to do with the region’s skilled labour force than the resource industries that they still service. These companies provide highly skilled workers a stable income and often make available training to less-skilled workers.

**Priorities**

4.3 **A more comprehensive and strategic approach is needed to capture appropriate (economic, environment and social) investment opportunities.** Policy makers do not seem to consider the embeddedness of organisations within the regional economy before committing public assistance funds to private companies. Governments at all levels should learn from the past. It is well documented that industries prone to offshoring and relocation will only stay in the region for the duration of their obligations as recipients of government grants. The recent departure of the Telstra call centre in Moe is one such example.

The co-location of resource-based network organisations into Latrobe Valley regionally based clusters could assist in maximising business resources, creating synergies for product and technological development, research and development, training provision, waste reduction and cutting down on transportation throughout the region and between Melbourne and the region. Road transportation serves as the primary form of moving dairy, vegetable, meat, paper and other forestry products to Melbourne contributing to the city’s road congestion. A strategy that involves identifying and encouraging flexible organisational network organisations to consider relocating their operations into Gippsland can provide some relief for the constrained road transportation system.
A paradox in the current arrangements is that much has been made by unions and enterprises, as well as policy makers about the skilled workforce in each of the resource sectors while also noting that economic revitalisation will bypass these workers unless there are targeted measures in place to ensure their future. At the moment, however, job quality appears to be a secondary consideration when it comes to public support for private sector investment and expansion activities. In some cases of private sector investment there appears to have been little benefit to local workers in terms of access to quality jobs. Job quality must be one of the measurements for evaluating economic development assistance along with company contributions to increasing educational attainment, wages and local labour force participation.

Assistance and support should focus on:

- supporting embedded organisations
- promoting inward investment and relocation as part of this embedding process
- expanding opportunities for local workers.

Public funds should not be spent stimulating the growth of any of these sectors without certain conditions. It should be required that there is a strategy in place to improve jobs and provide quality training that addresses local industry needs.

4.4 Establish an integrated and coherent investment strategy and policy for Gippsland as a whole, initially under the auspices of the Latrobe Valley Transition Committee. The aim of such a strategy would be to encourage inward investment with a standard approach to the region as a whole that assists with the building of industry clusters and value-adding activity around the region’s embedded resource-based industries. Such a strategy could incorporate business services development, utilising established facilities and providing a range of business and marketing support to small and medium business. Nonetheless, moves in this direction should be mindful of the existing often under-staffed, under-resourced and fragmented provision that currently exists (e.g. Enterprise Connect).

4.5 Continue to support the Latrobe Valley region as Victoria’s energy region, particularly through the diversification of energy sources and technologies to incorporate biofuel and renewables. As noted in the Directions for Latrobe
Valley Transition: Discussion Paper, 'converting or replacing coal-fired generators with gas-fired electricity production is considered the most likely short-term prospects for the Latrobe Valley'. Current trends, however, suggest additional gas-fired generators may be built elsewhere.

4.6 **Develop more integrated ways to facilitate inward investment and company relocation.** The elements of such an approach are currently spread between LGAs, and with state and federal government departments. The result is competition between agencies and often between the region and other regional areas, across Victoria and occasionally Australia. Additionally, these agencies confront the problem engendered by the tunnel vision view of Gippsland as a cluster of ageing smoke stacks. Current perceptions and the fragmentation of the responsible public agencies make this a difficult task. One way of overcoming these difficulties would be for the appropriate public investment agencies to work in an integrated and strategic way that positively presents the diverse opportunities in the region across all sectors.

4.7 **Promote and fund a time-specific job creation and industry development approach to value-adding within and between the resource sectors in the region.** This measure would involve employing industrial consultants to work with small- and medium-size enterprises (SMEs) in the region, where there is clear evidence of innovation and diversification. The target should be: identify markets; brand products; diversify business profiles; and stage an approach to export. Further, the proposed industry development approach to value-adding in the region could assist in better waste utilisation, improved product development, more targeted research and development and building up sufficient employer demand to train providers to offer specialised training for these growing industries. Such an approach would also focus on the enhancement of supply-chain integration and build networks of companies that could bid for and win larger projects which on their own they would be unable to do. This for example, could be done by linking the capabilities of local SMEs with a larger lead company.

These industry development approaches and projects would be structured so that:

- the foundations are laid for a collaborative engagement between public authorities, employers and the workforce in initiating a transition for selected enterprises in and between sectors
they deliver practical real-time industry intelligence and business and workforce development strategies that can directly lead to the creation of new:

- investment opportunities
- technology spinoffs
- skills and capabilities for the regional workforce
- markets in the fastest growing industries in the economy
- jobs and apprenticeships
- startups.

The aim could be to create up to 30 strategic collaborations across coal, forestry and agriculture between local companies and their combined 100 to 200 suppliers and customers that they work with locally, nationally and globally. Such collaborations would directly create new jobs and investment and build business and community confidence and ownership of the project.

This type of project involves industry mapping, investment profiling and job creation and industry investment (with an estimated 150–200 direct jobs plus 200–300 indirect ones and $50–$150 million of new investments by SMEs and lead companies). Such a job creation and industry development program would cost around $780,000 over a two-year period (Industry Development Advice, 2012).

**Consideration three: Presenting a revitalised Latrobe Valley region (and Gippsland)**

Attracting inward investment into the Latrobe Valley region has proved to be a major challenge since the privatisation of the SECV in the 1990s. Companies and potential investors frequently make media announcements about plans to invest in the Latrobe Valley but few of these investments transpire. This has contributed to frustration and a high level of cynicism among local community members about major business announcements. It has contributed to a significant amount of discussion and speculation about why inward investment remains a major challenge for the region. For many, the problem lies with the reputation and image of the region (Interviews and Workshops, 2012).

The image of a ‘dirty’ coal region that suffers from high unemployment and major social disadvantage is commonly perceived to be a barrier that other regional
areas like Bendigo or Ballarat do not have to contend with when seeking to attract investors. An equally common theme expressed by segments of the community is that the region’s poor industrial-relations climate is the ‘real’ barrier to inward investment (Interviews and Workshops, 2012). Major employers (power generators included) along with representatives from government departments are known to perpetuate the idea that inward investment is deterred by what they perceive as a poor industrial-relations climate and high labour costs in the region.

‘Militant’ trade unionism is typically invoked as a barrier to inward investment. Employers often claim that industrial unrest and associated problems date back to the period when the region’s power generation industry was state-owned. There is a view that unions relied on the region to build up their membership base (Interviews, 2012). Additionally, ‘inflexible’ and ‘outdated’ site agreements are cited as a problem. These views are often invoked to explain why local companies look outside the region for services and components. Previously such companies would have commissioned work locally. Such changes are evident in Esso’s recent decision to import a platform constructed in Indonesia rather than manufacture the platform at the Barry Beach marine terminal, as it might have done in the past. The construction and industrial-relations difficulties experienced by companies commissioned to build the Wonthaggi desalination plant are often drawn upon to support views of inflexible and militant trade unionism that purportedly make doing business in the region economically unviable.

Nonetheless, many companies interviewed expressed a different viewpoint regarding their experiences with their workforces and trade unions. Contract companies servicing the coal, electricity and oil and gas sector often associated their success with their skilled and dedicated workforces without ever mentioning the types of negative discourse expressed about labour and trade unions in the Latrobe Valley (Interviews 2011 and 2012). Interviewees had concerns about the labour costs, like most employers, but they did not perceive these costs to be higher than elsewhere. In some cases, they felt they were losing their best and highly skilled workers to other parts of country, particularly mining regions, where salaries were considerably higher. Other employers commented on how they see trade unions playing a constructive role by helping to find solutions for the difficult challenges ahead through their activities in organising industry forums and participation in tripartite committee processes such as the Low Carbon Transition Committee (Interviews 2011 and 2012). These more positive views, however, tend to be marginalised in public debate and discussion.

An examination of industrial action in the region indicates that this area is no more strike-prone than anywhere else (Rainnie et al., 2004). On the positive side, there
are many examples of cooperative and constructive working in the Latrobe Valley. Even when there is industrial action, there will be a range of reasons for it. Given the challenges ahead, it may be timely that this earlier commitment and the social dialogue among the tripartite actors be revisited and renewed. Of note, in 2003, a memorandum of understanding was signed by a number of federal, state, local government, private sector and trade union bodies in the Latrobe Valley pledging cooperation and support for the Latrobe Investment Facilitation Committee; a committee established to attract inward investment and promote the image of the Latrobe Valley industrial-relations climate in a more positive way.

Priorities

4.8 The major industrial associations for employers and unions in the region should be encouraged to sign a renewed memorandum of understanding committed to the principles and practice exemplified by the Latrobe Valley Transition Committee (a classic tripartite committee). The perpetuation of negative images about the region that occurs both within and outside the Latrobe Valley region continues to be a major challenge for attracting inward investment. For over a decade, the region has struggled with how to address this issue. As a first step, the ill-founded reputation of the Latrobe Valley region as a hotbed of ‘militant’ unionism must be confronted (see Rainnie et al., 2004 and Gibson, 2001 for full discussion). The profiling of unions as a positive force and the ways that unions and employers work together at the workplace, within the industry and at a regional level, must be promoted both within and beyond the region.

Considerations for Gippsland

Maintaining an economic base in an era that is shaped by the twin forces of increased urbanisation and moves towards metropolis and the increased international mobility of capital under globalisation, disadvantages many regional areas. Governments at all levels have struggled to find solutions to these disadvantages and have tended to rely on a mix of direct grants and subsidies to companies. The objective is to encourage them to relocate or maintain their presence in regional areas or infrastructure projects that can stimulate job growth temporarily with the hope that improved infrastructure will capture the attention of potential investors. These approaches tend to be expensive, often risky and not always equitable. Governments may be seen as favouring perceived winners or
those that have a major voice in the region; local governments are often seen as ill-organised, non-strategic and reliant on hit-and-miss inward investments. Further, it is not always the case that favoured businesses will remain in a region, beyond the requirements stipulated in their government grants. The question is how economic activity and investment can be embedded in this regional area.

**Consideration four:** Improving governance and authority

The major question facing the region is that of governance in relation to the four sectors, as well as the jurisdictional responsibilities and capacities of the different levels of government. In particular there should be consideration of who in the region (and broader Gippsland) should be responsible, and to whom they should be accountable for economic revitalisation. Current problems and difficulties include: the fragmentation and different resource base and level in each LGA; the different regulations and requirements that applied from one LGA to another (although this is less of a problem today than in the past); frustration with state government decision-making, particularly on planning but also in relation to changing policies and a lack of clarity about the relation between Victoria and the Commonwealth.

**Opportunities**

Governance and authority should be addressed as a condition for taking further steps to address the revitalisation of the resource-based economy that defines the region. At a minimum, the capacity of the three LGAs should be brought together on questions relating to economic development and revitalisation. There is a need for a single voice in relation to structural adjustment, and to centre-stage the diverse issues facing the region. The current governance structure is a major barrier to:

- coordinated inward investment programs
- land use across the different sectors
- addressing the problems of creeping urbanisation in ways that benefit the whole region and are not an unreasonable burden on a single LGA
- addressing the problems facing agriculture and forestry (which, after all, cover the whole region and the whole of Gippsland).

Fragmentation and competition contribute to prevent (or delay) the implementation of many worthwhile and valuable projects.
Identifying opportunities has not been the difficulty for the region (any number of reports including the Gippsland Development Plan and the Directions for Latrobe Valley Transition Discussion Paper demonstrate this fact). The difficulty has been developing clear priorities and coordinated action that will assist in job creation and attracting investment. One step that has worked elsewhere to address such problems is the creation of integrated regional authorities, often focusing on one aspect of structural adjustment, such as economic development and social impacts. For example, Cradle Coast Authority in Tasmania is an economic development authority with designated funding and authority, and the Appalachian Regional Commission in the US involves state, federal and county partnerships to promote the sustainable development of a disadvantaged coal region. The Latrobe Regional Commission of the 1980s played a similar role and maintained similar responsibilities and powers with comparable effect.

**Barriers**

The absence of a single and inclusive regional identity is a major barrier to integrated and cohesive strategies for the region and Gippsland as a whole. For state and federal governments, this results in difficulties in identifying the principle economic profiles of the region, working out the key stakeholders and deciding where and what support should be provided to the area. However, unlike other regions, it lacks a single key urban centre – a Bendigo/Ballarat equivalent. Thus it is difficult to focus on the region as a whole, with coherence and integration, and for the region to speak with one voice.

**Priorities**

There are three priority actions that could be taken either by the region or preferably Gippsland as a whole.

4.9 **Create a funded (per capita levy) Economic Development Commission for the Latrobe Valley region (possibly Gippsland) with authority to promote economic development across the sectors and the region (Gippsland).** Such an authority would have designated powers from the LGAs and would build on the economic development staff within each LGA. It should have the capacity to promote and develop region-wide strategies, with a specific remit to promote activity within and between sectors and bolster longer-term regional economic viability for the next generation.
4.10 Ensure that the primary mandate of a Regional Economic Development Commission is the development of partnerships between LGAs, local employers, and other non-government actors for the purpose of securing funding, facilitating inward investment and developing linked economic sustainability programs across the region. There is considerable evidence to suggest that the region and its vital industries are embracing the challenges of the low-carbon economy and establishing more sustainable practices. This is demonstrated through the activities of the Gippsland Climate Change Network, activities of trade unions and production changes being introduced by employers, involving energy efficiency and water-saving measures, recycling and improved waste utilisation. However, there is not a great level of awareness about these activities beyond the individuals and organisations directly involved. There are often lost opportunities to profile the region for its sustainable farming and industrial practices whether through water recycling in the meat processing and hydroponics industry or the use of waste product to produce biomass energy in the timber milling industry. Strengthening the links between employers, local government and others committed to strengthening sustainable industry practices through more formalised and integrated ways would assist in achieving further growth in this direction.

4.11 Enable the GLGN to take steps to resource and empower such a Commission, with a clear recognition that there should be equality of involvement in and benefit from the Commission. The intersection between the transition to a low-carbon economy and 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). In these situations, the aim of a Commission should be to alleviate and adapt to environmental challenges by working towards meeting the changing requirements for more sustainable economies with respect to new and changing industries, occupational profiles and skills requirements.

**Consideration five:** Ensuring the sustainability of resources

A question hangs over the sustainability of resources in the region. The future of renewable resources is uncertain and insecure (forestry and agriculture for instance) while energy resources have mixed futures. Oil and gas are finite resources that will be depleted over the next 20–30 years. While the coal resource
has a much longer timeframe, it is confronted with the need to produce a 'cleaner' and more environmentally sustainable product if it is to be extracted. If these resources are not made more sustainable – economically and environmentally – the danger is they will lose the social license to be used.

**Opportunities**

Ensuring the sustainability of resources requires a careful and well-considered set of policies relating to land use. It is clear that there is considerable competition for land use in the region: in relation to residential, industrial, large-scale dairy farming and crop cultivation; between small/medium horticulture and boutique agribusiness and new hydroponic agribusiness; over forestry land use and related biofuel, water and irrigation, coal and gas extraction. Local government planning approaches must recognise the need to preserve the sustainability of these resources and associated resource-based industries. To achieve this goal it will be necessary for LGAs to work together in a coordinated and agreed way.

With an integrated, linked and cohesive planning approach involving all LGAs, and working to a common objective of enabling the sectors to flourish as well as developing the region as an energy and food hub, the region has a positive future.

**Barriers**

The barriers to sectoral and thus regional development and revitalisation are numerous.

First, residential land zoning illustrates one set of problems. State policy requires that LGAs ensure the provision of a residential land bank to provide 15 per cent growth over a 15-year time horizon. In practice, residential growth in some LGAs, Baw Baw in particular, has contributed to a sizable percentage of the 15-year land bank being used over the last five years, indicating that there will be an incremental demand for the bank to expand beyond the formal policy provision. Such an expansion is likely to result in ad hoc and unplanned incursions into agricultural and related zones. There appears to be little recognition of alternative forms of urban and related development. Greater consideration could be given to both the type and location of development, in order to preserve the region's forestry and agricultural assets, and encourage urban and industrial growth along transport corridors.
Second, the impact of statutory overlays on land use, such as coal resources, impact on other economic possibilities in the area. Traralgon for example is surrounded by a combination of coal reserves and flood-zone requirements. These factors mean that physical growth and expansion for the town will be limited. Complementing such restrictions are the seeming opportunities for urban growth and expansion in such towns as Warragul, where agricultural land is increasingly rezoned as residential. Such spatial features are worked out in different ways across the Latrobe Valley region.

Third, another feature of these planning arrangements is that the service providers who control the resources are not organised on a regional basis, although their strategic plans may be focused on the region. In the case of water management for example, there are two authorities, Gippsland Water and South Gippsland Water. No doubt these authorities are well organised and operate in responsible ways. The difficulty is that the LGA boundaries do not necessarily align with the authority boundaries and this also creates difficulties for planning.

Fourth, perhaps the most controversial of recent planning arrangements is the possibility of breaking up farm land for the purpose of urban and peri-urban subdivision. On the one hand, owners may have an interest in such subdivision, for wealth and de facto superannuation arrangements, particularly where there is no succeeding generation in the business. On the other hand, the very same people may have a concern for and commitment to maintain prime agricultural land in production. These complications are further beset by: coal reservation; different and unregulated use, such as timber plantations on prime agricultural land; water restrictions in the case of horticulture; and so forth. Indeed, further complications arise when councillors have their own, often unacknowledged, conflicts of interest, as developers in some cases and as promoters of the local economy.

Priorities

4.12 Develop a coordinated and interlinked planning and regulation process for the utilisation and availability of resources in the region. Gippsland, including the Latrobe Valley region, is subject to planning uncertainty and fragmented policy development. This situation is illustrated by the range of reports in process covering land use, water catchment, forest resource, food security and so on. The problem overall, is that fragmented decision-making fails to integrate various sectoral interests and that such decisions are often informed by strong vested interests. It is a priority that these matters are addressed. A first step would be to ensure firstly that long-term planning
principles for the whole region are put in place, with a single accountable authority at a Gippsland level. The reports that are in process are necessary and desirable, but equally it is critical that they are dealt with in a manner that ensures consistency and consideration for the overall resources in the region and the area that makes up Gippsland. Anything short of such a step would ensure that the current mix and fragmentation remains in place and would thus jeopardise the sustainability of resources in the area.

Without a coordinated and interlinked planning and regulation process for the utilisation and availability of resources in the region, it will be impossible to secure the forestry resource, protect agricultural land in equitable ways and enable the development of possible large-scale use of the coal resources.

**4.13 Establish a body modelled on the Latrobe Valley Transition Committee with the delegated authority to approve and implement planning decisions.** Part of the improved planning policy may be achieved by the forthcoming Latrobe Valley road map, but this will be the first step only. All levels of government must be involved, as is the case with the current transition committee. Without such involvement and cooperation, the region will continue to be buffeted and diminished by the competing interests that are in danger of paralysing the structural adjustment of the region.

**4.14 Establish a small but permanent support unit comprising staff from the three levels of government to ensure that all sector reports and reviews are coordinated, both within sectors and between them, as well as to facilitate policy approaches that take the integrity of the resource base into account.** To achieve such an outcome it will be necessary that the support unit has adequate resources, facilities and authority as well as accountability.

**Consideration six: Maintaining the skills edge**

The key to a structural adjustment program is a skills policy focused on developing a comparative advantage via a skilled workforce. The region is seen as an area with a relatively high skill base, resting on the past history and current situation of the power generation industry, as well as oil and gas, and to a lesser extent the paper industry. In addition, there are signs of labour shortages in agriculture, forestry and related areas of employment.
Opportunities

The region’s skilled labour in areas of engineering, electrical, manufacturing (metal fabrication, fitting and turning) and construction are perceived to be a competitive advantage for the region. Many of these workers first developed their skills in the well-resourced apprenticeship training programs maintained by the SECV before the industry was privatised and apprenticeship training was wound back in the early 1990s. Most of the contract companies servicing the oil and gas and electricity generation sectors expressed views that the skilled labour present in the region was critical to their ongoing success. Many also spoke of the ways their skilled labour supply made it possible to successfully tender for work outside the region and provide services interstate and overseas.

While perceived as a regional asset, there is concern among some employers, local government officials and union leadership that the access and development of these skills are in decline. Some research participants felt other regions may be overtaking the Latrobe Valley region in the development and supply of these important trade skills and thus are better able to encourage the sorts of industries that have historically been attracted to the region.

Barriers

Multiple factors have been identified as contributing to the slippage of the regional skills advantage including an ageing and retiring workforce, poor completion rates among apprentices, lack of support for apprenticeship training among employers and the migration of skilled labour out of the region. It has also been noted by research participants and previous studies (e.g. Snell and Hart, 2007) that the quality of training in the region may also be declining and that while many workers have obtained official qualifications and certificates, employers can no longer rely upon them to adequately reflect the skill levels among these workers. In these circumstances employers may begin to recruit more widely beyond the region when sourcing labour, and there is evidence that this is already happening for higher-level skill requirements in agriculture, food processing and the energy-related industry.

Labour concerns, however, were not restricted to skilled workers. Reports, formally and informally, from the agriculture sector frequently indicated that the recruitment of unskilled and semi-skilled labour to perform necessary work (e.g. milking, harvesting of vegetables, etc.) was proving increasingly challenging. Unlike many other industries, labour-saving technologies were not feasible due to the nature of the work (although increasingly these areas of employment are
upgrading the technologies used to harvest and milk). This shortage of unskilled labour in the agriculture sector is also perceived to be a constraint on the future expansion of that sector.

Training and education in the Latrobe Valley region is deficient and constitutes a barrier to a future for many in the region, particularly the young but also those who have been and will be displaced because of the moves to a low-carbon future. The Latrobe Valley region has a low Year 12 / VCE retention rate, as is the case for Gippsland as a whole. This feature has led to analyses advocating the improvement of the region’s overall skills profile and participation rates, particularly in higher education (Gippsland Regional Plan Control Group, 2010 and Edwards et al., 2011). This is a region with a range of educational and training resources, including schools, training bodies, TAFE and higher education facilities. It is also a region where the data indicates a low take up of training and tertiary educational opportunities. It is a region that has been transformed over the last 20 years from one that provided at least 1,300 apprentices each year to a region where it is fortunate if there are 100 apprenticeships per year.

Increasingly, responsibility for apprenticeship training has shifted from employers to government-funded arrangements. These include training bodies contracted to provide training and support apprenticeships. There has also been a decline in employer-based and focused apprenticeships. The problem appears to be that apprenticeships are a cost that does not result in productive value for the employer for a number of years. One problem is that there is extensive evidence that employers are not willing to bear the cost of training but rather are prepared to ‘buy’ skilled workers. It is in this context that the comments by employers about lack of work readiness of school graduates, trainees, apprentices and qualified but inexperienced workers should be judged. What is overlooked is that there is no possibility for apprentices or trainees to gain experience and skills associated with the jobs that are on offer. The result is a mismatch and continuing discrepancy with the supply of workers and their employment.

**Priorities**

**4.15 Formulate and implement a Next Generation Workforce Development Strategy.** Transition involves uncertain futures for specific skill sets, which will require government intervention to manage and support. For this to occur, however, there is a need to have inclusive strategic planning in which workforce development activities are integrated with economic development activities. Regional success in the future will depend upon
sound workforce development practices and institutional support for education and training. Policies on skills acquisition, skills recognition and upskilling should be premised on the understanding of sociodemographics of the workforce and the organisational design of these sectors. One way to promote this aspect is to encourage the development of a ‘next generation’ workforce development strategy involving major industry actors, training providers, institutions of higher education, State Government Industry Link Officers and trade unions. Such a strategy could assist with aligning industry needs and community and worker expectations regarding skills and job and training quality.

4.16 Support the Local Learning and Employment Networks to develop ‘pool’ apprenticeship arrangements in at least two centres in the region. Industries and local employers are often not in a position to consider long-term investment in apprenticeship training, particularly in times of uncertainty. Priorities are often directed to the short-term needs (finding skilled workers) and in many cases resources are not able to be stretched to include long-term training. As economic circumstances pick up, it often takes a longer time for the apprenticeship positions to be re-established in a region, creating a gap in the available apprentices and future skilled workers.

Support should be given to the engagement of a pool of apprentices in identified skills shortage areas potentially through the group-training model that would maintain the level of training and skills development prior to host employers being available. Local Learning and Employment Networks in Gippsland have the capacity to broker the necessary partnerships which can include training bodies, group-training organisations, government and community organisations. Such an arrangement would ensure that apprentices have continuity with host employers and training bodies and that training quality is maintained. This arrangement could assist with the ongoing supply of apprentices and skills to meet the current and future needs of industries in the region.

4.17 Develop and resource career-awareness events as well as further develop work experience programs in the resource sectors, including forestry and agriculture. The aim is to create an awareness of the reality of these areas of employment. Already enterprises such as Burra Foods (Korumburra) and others are offering gap-year opportunities to final-year school students, as well as promoting project-based educational activities within the business. While welcome, these efforts should be promoted across the region in a well-resourced and supported way.
**Consideration seven: Research and development**

Research and development is recognised as a key condition for revitalisation. In this context, the *Gippsland Regional Plan* states that there is an opportunity to promote and develop a Centre for Sustainable Technologies, renamed Centre for Sustainable Industries. Such a Centre supported by key actors in the region, such as the LGAs, the main business interests, trade unions and related bodies, could begin to consider new technologies and the social impact and support necessary for the implementation of these technologies in ways that would benefit the region.

**Opportunities**

One of the advantages of considering the flexible organisational network is that it illustrates and identifies the areas available for sectoral developmental linkages and prospects that may enable firms to diversify. Increasingly emphasis should be given to non-coal related fields and technologies for research development investment. At this moment, targeted investment elsewhere may encourage greater activity across all the sectors, and not just in relation to coal where investment and technological decision-making will be largely determined by international fuel prices.

There are indications that the existing tertiary educational bodies in the region are taking steps to provide a more integrated and mutually supportive education environment. Such a move will have benefits for research and development as well as for promoting the skills acquisition necessary for a more technologically focused region. It is important to note here that such measures build on existing but often limited practices that have been in place for many years. Further afield, there are also important bodies, such as the Monash Sustainability Institute and the CSIRO which have contributed to the way in which the region could begin to move forward (e.g. Climate Works Australia, 2011).

Nonetheless, considerable support has already been granted to energy-based industries for exploration and research and development activities. This funding has come in the form of public assistance and from private sector corporations. Returns from the energy resource sector tend to be sufficient to build up research and development capacities. Already there has been extensive investment in ‘clean coal’ or low-emissions technologies. It is likely that this will continue, not only in relation to Gippsland but also more generally in Australia and worldwide. This is not the situation with agriculture and forestry/paper where a more extensive
program of research and development would value-add to these sectors. The further important point is that ongoing research is also needed to monitor the regional economy, industry linkages and value-adding activity as well as community assets.

Barriers

Regional economic diversification and considerable social benefit have usually occurred where regions have directed resources to develop education and skills in the region by improving infrastructure, promoting universities and tertiary education, and investing more in research and development (Fairbrother et al., 2012: 111). In the case of Gippsland, there has been a decline in targeted research and development in relation to the agricultural and forestry sectors in this region in recent years. One consequence is that there is limited capacity to promote and develop an economically diverse region and a set of sectors where ‘flexible organisational network’ actors are engaged.

As this report has pointed out, there has been considerable research carried out within the Latrobe Valley region. It appears to be one of the most researched regions in the state. Some of the priorities and considerations put forward in this report are reflected in other reports and the research team has sought to highlight the importance of this earlier work. The team has also noted that many local development strategies have been pursued in the past. There is however, a lack of evaluation of these programs. The lack of monitoring runs the risk of undermining the support for them. Left unchecked, these views may contribute to additional policy challenges for the region when decision-making is critical.

Priorities

4.18 Improve policy by monitoring what works, including all structural adjustment programs, and what has already been done. All structural adjustment programs should be accompanied by constant and rigorous evaluation, reported publicly, so that the local community and government agencies know what is working and what should be scaled up. This requires a financial commitment and the political will to verify successful and unsuccessful programs using the most credible research methods, and a willingness to publicise the outcomes.

4.19 On production of a business case that includes an appropriate research focus and cross-institutional involvement, the Centre for Sustainable Industries should be funded and developed in Gippsland. Such a Centre
should have a broad remit, on each sector, taking into account the inter-relationship between the natural and social sciences. It should be multidisciplinary and involve a range of educational institutions, because of their different capacities, although based on the major tertiary bodies located in the region. The proposed Centre will need targeted and ongoing support. This is not only to ensure that the projects are manageable and undertaken but also to ensure that research staff are supported in terms of their career objectives as internationally recognised scholars as well as contributors to development and transition within the region.

**4.20 Steps should be taken to ensure that suitable sector research is undertaken by a range of research bodies (industry research associations, universities and other research organisations) as well as by local industries and related industrial organisations.** Such an initiative requires steps at a federal level to engage funding bodies in projects that are relevant for many regional centres in similar situations to Gippsland.

Research capacity in regional areas is best sustained when local industries assist in facilitating and supporting this work. Industry support will be critical for research programs and centres such as the Centre for Sustainable Industries. Partnerships between government, industry, universities and other research agencies open up the opportunity to drive innovation and to take steps towards a more sustainable economy.
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Appendices

Appendix 1: Research methods
Appendix 2: Scenario workshop analysis
Appendix 3: Report on the global forest products industry
Appendix 4: Full interview schedules
Appendix 1: Research methods

For the purposes of this research, we have adopted a case-study approach to consider the current trends and future prospects for four natural resource sectors: oil and gas, forestry and paper, coal and electricity, food and agriculture (agribusiness). Three sources of data inform this project. The first is documentary analysis, involving a review of existing reports on the Latrobe Valley region. The research team then conducted interviews with key representatives, employees and employers within the four sectors (Appendix 4). The third source of data was a series of scenario workshops, conducted with key stakeholders from local government, non-governmental organisations, educational providers, business groups, and employers from the four sectors.

Documentary and statistical analysis

An important source of data for this study is the many reports that have been generated on the region as a whole or in relation to specific sectors. Within these reports there is debate about the genuine prospects for economic diversification within the Latrobe Valley region. To a certain extent, these differences hinge on whether or not the so-called ‘clean coal’ technologies are viable in the shift to a low-carbon economy. The Gippsland Regional Plan (Gippsland Regional Control Group, 2010), for example, predicts that a shift to clean coal technologies could create growth and help offset employment losses in the coal-based electricity sector. No other major reports emphasise this possibility, although CCT is mentioned in the Positioning Latrobe City for a Low Carbon Emission Future report produced by the Latrobe City Council in 2010 (Latrobe City Council, 2010a). There are also considerable differences between reports in relation to the extent and nature of government intervention required in the region. Further, the reports vary in their perspective on the region’s ability to achieve resilience and growth after the expected contraction of the electricity generation sector and associated job losses.

Within the present study, this material is complemented by statistical analysis of available data. To provide a broad understanding of the demographic and socioeconomic structure of the region, the research team has drawn on a range of 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 has been used to provide in-depth analysis of the four resource-based sectors within (and beyond) the Latrobe Valley region, including the size of
the sector, the age, gender and occupational structure of the sector, and the educational levels and post-school qualifications within the sector. Census data has also informed the analysis of household composition and the proportion of household income generated by individual incomes from within the power industry. Investment data presented in this report is drawn from the statistical sources provided by the three LGAs that make up the Latrobe Valley region. While the source and provenance of this data varies in terms of quality and comparability, we have provided cautions as we proceed.

**Interviews**

Complementing the documentary analysis, the research team carried out a range of face-to-face interviews. The purpose of these interviews was to focus on the research questions and provide ethnographic data for analysis and understanding. These interviews were conducted with acute awareness of the sensitive nature of the subject matter and the need for confidentiality.

The range of stakeholders interviewed for the project included:

- CEOs (or equivalent) of relevant companies
- HR managers
- local, state and federal government representatives
- farmers
- employers and employers associations
- union representatives
- representatives of industry associations
- individual workers.

Participant numbers can be found in Table 1. Supplementing this data was material collected through interviews in an earlier study by Fairbrother et al. (2012). This material was primarily in relation to the coal sector. The interviews from this earlier study are not included in Table 1.

The interviews were generally conducted at the place of employment, but occasionally also elsewhere at a participant’s request. They involved both individual face-to-face interviews and group interviews. All interviews were recorded at the consent of participants and later transcribed.
Scenario analysis

In addition to interviews, data for this research was generated through a series of scenario workshops. Four workshops were held at various locations in the Latrobe Valley region over a six-week period. These workshops engaged a range of stakeholders from key sectors: agribusiness, forestry, power generation, coal extraction, education and local government. The workshops enabled stakeholders in the Latrobe Valley region to consider ‘extreme futures’ and to identify and discuss key issues that are seen as central to future planning and policy-making.

The use of the scenario method represents a particular way of thinking. It is ‘a mode of inquiry and analysis that enhances knowledge and understanding in order to inform and support planning’ (Wright and Cairns, 2011: 14). The scenario method is ideally suited for exploration for issues that, as here, are of central interest to the participants, but are subject to considerable uncertainty as to how they might unfold over the coming months and years. The scenario workshops in this project were designed to facilitate ‘strategic conversation’ (Van der Heijden, 1996) amongst groups of involved and affected stakeholders on the possible and plausible futures that may unfold over a particular timeframe. In the case of this project, the timeframe given was the period to the year 2022. Workshop participants were asked to consider a focal issue of mutual concern: the future of the Latrobe Valley region in light of the transition to a low-carbon economy. The possibilities were captured in a number of medium-term scenarios that were designed to push the thinking of participants to the extremes of possibility and plausibility.

There is considerable variety in the types of scenarios that can be used in such an exercise, as well as in the methods for constructing them. These range from long-term global scenarios prepared by futurists to short- to medium-term local scenarios prepared by involved parties, most often with external facilitation. The ‘basic method’ (Wright and Cairns, 2011) of scenario development enables involved and affected stakeholders – with or without external facilitation – to work together to develop a set of four scenarios that, taken together, define the ‘limits of possibility and plausibility’ for how the future is likely to unfold. For a longer-term project with options for multiple iterations of scenario development and for research and analysis between iterations, a more complex scenario method would be more appropriate. Due to time and place constraints, an alternative method was used in this project. Here, the scenario approach is based upon the ‘backward logic’ (Wright and Cairns, 2011) method of constructing extreme scenarios. This approach invites the involved and affected stakeholders to respond to one or two, ‘extreme scenarios’ – outlined by the external facilitator – in terms of
a critical analysis of their degrees of possibility and plausibility in order to address the above aims.

This approach aimed to explore the likely impacts of the scenarios on the region’s society and economy, and to stimulate debate on the current and possibly future policy and planning decisions. These scenarios were offered as contemplations of extremes of possibility and plausibility, to prompt discussion and exploration of the following questions:

- What might cause the worst extreme direction to unfold?
- Who would take what decisions that might accelerate this trajectory?
- What decisions and actions can be taken and what policies implemented in order to attenuate this development?
- What decisions and actions can be taken and what policies implemented in order to guide the future towards the best extreme?

Specific details of the scenarios presented to participants in these workshops can be found in Appendix 2.

In the first scenario workshop, a range of diverse participants from the agribusiness sector responded to one presented extreme scenario. The following two workshops built on the material that emerged from this first session in the form of two extreme scenarios and engaged participants from the full range of sectors covered by the project. From these workshops, a summary was developed of the range of key factors that participants believe will shape the future of the region. This summary was presented to participants at the fourth and final workshop, along with a third scenario that captured their most ambitious projections for the region. This final workshop enabled participants to reflect on the findings from the scenario workshop process, and to provide feedback and further suggestions.

Participants identified those factors that they deemed open to influence and direction through intervention by local, state and federal stakeholders, and pointed to relevant policy implications for positive action. They also identified those factors that are not open to such direction, and pointed to policy implications for mitigation of and adaptation to negative outcomes. Thus, the workshops offer a new perspective on how key stakeholders see opportunities and constraints unfolding in the Latrobe Valley region in the next decade.

All scenario workshops were recorded at the consent of participants and later transcribed. The total number of participants in the four scenario workshops can
be found in Table 1. Participants who attended more than one workshop have only been counted once.

**Summary of participants**

Table 1: Summary of interview and workshop participants

<table>
<thead>
<tr>
<th>Position</th>
<th>Sectors</th>
<th>Number interviewed/consulted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise and company representatives</td>
<td>Coal and electricity</td>
<td>9</td>
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<tr>
<td></td>
<td>Gas and oil</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Forestry and wood products</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Agrifoods/agribusiness</td>
<td>11</td>
</tr>
<tr>
<td>Government representatives</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Non-government organisations</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Unions</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Others/ experts</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Scenarios</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>90</strong></td>
</tr>
</tbody>
</table>
Appendix 2: Scenario workshop analysis

Scenario workshop 1
Participants: 5
19 March 2012
Department of Primary Industries
Hazeldean Road
Ellinbank

Scenario workshop 2
Participants: 11
23 March 2012
Regional Development Victoria
33 Breed Street
Traralgon

Scenario workshop 3
Participants: 12
29 March 2012
Lifeline Gippsland
2 Fleming Street
Morwell

Scenario workshop 4
Participants: 19 (8 new)
26 April 2012
Lifeline Gippsland
2 Fleming Street
Morwell

Introduction

Part of the Identification of Opportunities to Support Structural Adjustment in the Latrobe Valley project involved a series of scenario workshops. These workshops engaged a range of stakeholders from key sectors: agribusiness, forestry, power generation, coal extraction, education, local government. The workshops enabled stakeholders in the Latrobe Valley region to consider ‘extreme futures’ and to identify and discuss key issues that are seen as central to future planning and policy-making.

Background and context

The scenario method is ‘a mode of inquiry and analysis that enhances knowledge and understanding in order to inform and support planning’ (Wright and Cairns, 2011: 14). Scenario workshops are designed to facilitate ‘strategic conversation’ (Van der Heijden, 1996) amongst groups of involved and affected stakeholders on the possible and plausible futures that may unfold over a particular timeframe (in this case, the period to 2022) in relation to a focal issue of mutual concern (in this
case, the future of the Latrobe Valley region and the transition to a low-carbon economy).

The specific scenario approach employed here invited stakeholders to respond to ‘extreme scenarios’ outlined by the project team, designed to push stakeholders’ thinking to the extremes of possibility and plausibility for the future of the region. Based upon the presented scenario outlines, stakeholders explored likely impacts of their end states at 2022 on the broader regional society and economy, in order to consider current and possible future policy and planning to bring about positive outcomes.

**Previous scenario studies involving Gippsland**

The approach adopted for this project differs from those used in previous studies. The scenarios used in *The Timber Industry in Gippsland: A socio-economic assessment* (Gippsland Private Forestry, 2005), for example, focuses primarily on economic modelling. The scenarios used in that case were not focused on stakeholder engagement, as is proposed for this project, but rather were developed by modellers to try to determine likely outcomes in terms of gross value of output and socioeconomic impacts for the forestry industry in Gippsland. Such scenario modelling offers comparatively narrow options for further analysis and does not provide insight into how stakeholders perceive the current situation or their future plans.

The *Regional Effects of Pricing Carbon Emission: An adjustment strategy for the Latrobe Valley* report (Weller et al., 2011) draws on scenarios first proposed by Victoria’s energy regulator Vencorp in 2008, to ‘identify the possible effects of the carbon pricing for transmission system planning’ (Weller et al., 2011: 64). Workshops were initially held with representatives of various sectors of the energy industry to help identify factors that might affect transmission investment (Vencorp, 2009). This followed the ‘basic method’ (Wright and Cairns, 2011) of scenario analysis and produced four plausible scenarios. In their analysis of the Vencorp scenarios, Weller and colleagues argue that:

> The future of the Latrobe Valley will depend on decisions that State and Federal Governments make about the extent that they are willing to fund new transmission networks.

(Weller et al., 2011: 69)
Scenario workshops of this type, therefore, clearly provide important insights. However, it must be emphasised that the scenarios put forward by Vencorp were focused around one industry and did not offer an ‘extreme scenario’ possibility, as is the approach of this project.

Finally, scenario workshops were also central to the Boom or Bust: Possible futures for Victorian brown coal in a carbon constrained world report (Earth Resources Council, 2010). Again, the ‘basic method’ was employed and four scenarios regarding the future of brown coal are proposed, based on over seven months of research and consultation with participants. According to the Earth Resources Council, these participants were ‘leaders from Victoria’s energy sector’ including suppliers, environmental groups, NGOs, unions, technology developers, financiers and government.

The scenario workshops conducted here, however, were much more broad-based in terms of participants than previous studies. The aim was to talk to a cross-section of stakeholders related to the four major industries which are central to this project (coal, oil and gas, agriculture, paper and forestry) as well as additional stakeholders from NGOs and the public sector. The aims, therefore, were much more tied to the future of the Latrobe Valley as a region, and how the futures of various industries are inter-related, rather than focusing on the specific fate of one industry. Also, as mentioned above, and discussed further below, the workshops for this project focused on ‘extreme scenarios’ (Wright and Cairns, 2011) that have not been trialled in previous studies.

Scenario outlines

Three scenarios were presented to participants during the series of scenario workshops. The first two were initially formulated through the analysis of documents, statistical material and the interview research undertaken by the research team. They were then presented, developed and refined during the first three scenario workshops. Each scenario offers a different perspective on the Latrobe Valley region in the year 2022. Scenario 1 looks back at the aspirations of stakeholders at the end of 2012. Scenario 2 outlines a view of the region in 2022 in which these aspirations have not been met. The third was developed in response to the conversations in the first three sessions in order to provoke discussion in the fourth workshop. This scenario presents an aspirational future for the Latrobe Valley region. The first two scenarios are detailed below.
Scenario 1: ‘A future for the taking’

Looking back to 2012, there was a positive vision of the Latrobe Valley region of the future that was built on the foundations of the key resource industries. There was, however, acknowledgement of the need for adaptation and change, recognition of the core value of resources to the region, focused education and training to meet social and industry needs, and advocacy for necessary infrastructure development, particularly rail. Key indicators of success were seen to include:

- growth of the agribusiness sector, with specific strengths in two areas: major producers linked to national and multinational processors and distributors working in the international market; and small/medium independent ‘boutique’ producers working collaboratively to build ‘brand X’ – regional brand as the umbrella
- linked to this, the growth of agritourism and inward investment in one or two resort hotels, with leisure and conference facilities
- investment in the coal sector both as a provider of fuel to a new ‘clean coal’ generation industry, and as a key exporter to China through the expanded Port of Hastings
- development of new gas and biofuel generation, drawing upon Bass Strait and coal seam gas, and wood waste from forestry and related industries
- sustainable forestry supplying a successful paper industry using high-spec technologies and linked to biofuel development
- improved rail links for both passenger and freight traffic as part of Hastings development
- provision of a food export route via opening up of RAAF Sale for commercial freight flights
- a rejuvenated local population, with investment by individuals, organisations and government in training and development for high level skills in these key industries
- an overall vision of population and skills development both through increased local opportunity and through improved transport routes to Melbourne and the eastern suburbs.

In 2012, the key drivers for this future were seen to be partnerships: collaboration at local, state and federal levels, between public and private sectors, and across industry sectors and companies. These partnerships would promote and enable policy changes to align land-use planning with relevant needs; industry, agriculture, residential and leisure; and promote infrastructure development; primarily rail, but also air, sea and road. This would occur within a continuing strong Australian economy and rejuvenated global economies.
Scenario 2: ‘Paradise lost’

However, looking back now from 2022, what you see around you is derelict industrial buildings and sites, vacant shops with faded ‘to lease’ signs, ill-kept and abandoned houses and a general air of dereliction. This state comes at the end of a decade of continuing global economic turmoil, conflict in the Middle East and into areas of Asia, protectionist policies in the US and Europe and poor relations between Australia and its immediate neighbours. At the same time, in the Australian context, there was a failure to integrate policy and planning for: regional, state and federal; public and private; industry and leisure; and other such competing interests. The region is now identified by:

- collapse of local forestry business: a ‘one horse’ industry that was reliant on a single major client in the paper industry. Small mills have long ago failed within a highly competitive global market, while majors were taken over and shut down by multinational players with other interests. This was accelerated as increased bushfire activity disrupted forestry under climate extremes
- closure of oil refining capacity as outdated refineries were closed down by existing owners, or bought out and closed down by new global players from Asia, and as demand in Australia peaked and was met from more cost-effective refineries in Asia
- weaker than anticipated demand for resources from China, linked to changing demand patterns as black-coal exports out of Gladstone grew and eclipsed the brown-coal export market
- power generators accelerated plans for closure of coal generation capacity as carbon tax and inflation struck home to domestic users and electricity demand dropped in a weak economy with growing urban poverty and rising unemployment
- first-to-market opportunities for biofuel and clean energy development were lost due to inertia at local, state and federal levels, and as the NSW government grasped the initiative with inward investment partners
- overall, the resources sector took multiple hits, as oil and gas resources started drying up, there were insufficient plantation trees to sustain the paper mill, and coal lost its social license and went into terminal decline
- at the same time, reliance on construction as a driver of economic growth proved a chimera, as there was little or no demand for construction of anything – homes, businesses, and infrastructure. Hope placed in the latter proved ill-conceived as public private partnerships dominated infrastructure procurement nationally and the private sector saw no profit in the region.

Based upon initial collaboration and environment conditions, food production in the region grew from 2012 to 2015 as Gippsland’s climate became more
competitive relative to an increasingly unreliable Queensland climate, and as Victorian population and demand grew faster. However, at the same time:

- the collaboration effort failed to gather momentum and competition dominated, both between local players and across the market
- low-cost food supplies dominated the market demand side, while high production costs hampered local suppliers
- imports from NZ grew as its climate ‘improved’ under global warming and, at the same time, supermarkets held milk prices down, forcing dairy farmers to the wall
- initial approval to use RAAF Sale for commercial flights proved unsustainable when the military relocated operations to Darwin in 2015 and the airport proved not to be commercially viable
- land prices were initially driven up by urbanisation, forcing farmers off the land and raising costs for those that remained. Competition between sectors for land use in the early 2010s (trees versus coal versus farming versus domestic construction versus coal seam gas) caused local conflict
- an ageing workforce through the 2010s saw the labour pool decline. Most incomers to the new housing stock commuted to the city or the eastern suburbs to work
- local young skilled labourers chased the ‘big bucks’ in the mining sector, initially in Western Australia then into Far North Queensland and parts of the NT
- in the farming industry, or what’s left of it, few Australian workers want to work in labour-intensive and relatively poorly paid jobs. At the same time, under pressure from the metropolitan electorates, governments have curtailed immigration and temporary work visa schemes, so there remains a labour shortage.

It should be stressed that these scenarios are not predictions of any future that is presented as ‘probable’ or ‘likely’. They are, however, offered as options that are both possible and plausible. They represent ‘extreme scenarios’, intended to spark debate on chains of causality in the domains of the political, economic, social, technological, ecological and legal (PESTEL). They are designed to facilitate the identification of the key decisions and actions that are required if the region is to realise the future that it desires.
Key issues shaping the future

From the scenario workshops, the following issues were identified as being crucial to establishing the building blocks towards a thriving Latrobe Valley region in 2022 and beyond. Failure to address these issues at the level of policy and planning in the near future will hinder development towards a brighter future, and will drive the region towards the dire future outlined in Scenario 2.

1) Infrastructure policy and planning:

   a) failure to develop integrated policy for rail links for both freight to market and commuters to city
   b) fragmentation of ownership and management of rail infrastructure and train services
   c) land for future rail expansion is becoming less available as urban sprawl restricts corridors
   d) ongoing uncertainty as to policy and planning for Port of Hastings, Port Anthony and related land links
   e) lack of integrated regional policy and infrastructure to ensure supply, storage and distribution of water supply to support the ‘food bowl of Victoria’
   f) poor transport links at right angles to the central rail/road corridor
   g) underdevelopment of air transport link capability for logistics

2) Land-use policy and planning:

   a) failure to develop land use policy that resolves conflicts: residential, industrial, large-scale dairy farming and crop cultivation, small/medium horticulture and boutique agribusiness, new hydroponic agribusiness, forestry and related biofuel, water and irrigation, coal and gas extraction
   b) fragmented decision-making that fails to integrate various sectoral interests and that is informed by strong vested interests
   c) policy requirement for the provision of a residential land bank to provide 15 per cent growth to a 15-year time horizon. The reality is that 8 per cent of the 15-year bank has been used in the last five years, indicating that there will be an incremental demand for the bank to expand beyond the policy provision
   d) linked to this, there is no recognition of an option for land intensification within the urban boundaries – high rise on inner city transport corridors
3) Power generation policy:

a) lack of planning for and investment in power generation facilities that will realistically meet current and future demands
b) lack of political and social licence for brown coal – not a technical issue
c) failure to face up to the fact that the only current alternative to brown-coal power generation is power cuts in the short–medium term and 100 per cent hikes in electricity prices in the medium–long term as investment backfills capacity to meet demand

4) Forestry policy, planning and society engagement:

a) lack of interest at federal government level to develop and support industry-friendly policy
b) forestry lacks ‘social license’ and is subject both to party political constraints and local societal negativity
c) current inability to remove and use waste limits opportunities for biofuel development
d) lack of local interest with few younger workers and an ageing staff profile
e) while there is implicit support for forestry as an industry, there is lack of acceptance of its associated activities, particularly transport of materials offsite on public roads
f) growing conflict of interests between incoming house residents and timber logistics

5) Education, training and labour supply:

a) the regions is perceived as having strong skills in areas of engineering, electrical, manufacturing, construction, etc., but these are declining and the workforce is ageing
b) lack of both employer and educational institute response to and support for this issue is seen as a driver to Scenario 2
c) disadvantage of regional youth in access to higher education due to time and cost constraints on access to metropolitan higher education and limited and non-aligned local provision
d) the shortage of unskilled labour to the agrifood sector is seen as an issue of concern – as per Scenario 2
6) Cultural issues – fragmentation and dependency:

a) lack of a single key urban centre – Bendigo/Ballarat equivalent – identity focused on several towns and not on Latrobe City
b) lack of a singular and inclusive regional identity to represent Baw Baw, East/West Gippsland, etc. inclusively at local, state and federal levels
c) lack of local aspiration and commitment to a positive attitude – negative perceptions pervade in local community and media
d) previous projects seen to fail due to dependency; on external funding that runs out and/or on individuals that move on from key roles – failure to build sustainable projects

7) Economic conditions:

a) conditions of external investment in public private partnership projects not aligned with local priorities and investment needs
b) lack of local consideration of questions of why investors in macroeconomic environment would consider investment in region

8) Lack of decision-making on key issues:

a) impact of short electoral cycles and political conflicts across regional, state and federal arenas
b) state and federal governments seen as lacking interest in regional issues
c) local politics driven by vested interests and power inequalities

The project team confirms that this list of issues was derived through a structured content analysis of the conversations of workshops 1–3 by the facilitator, Prof. George Cairns, and that it has been subject to subsequent review by the other team members who were present at the workshops. Validation and finalisation of the list of issues was enabled through the fourth workshop, where participants were invited to review, respond to and refine the list.
Workshop four: Concluding the workshop process

For the fourth and final workshop, a third scenario was developed that captured the most ambitious projections of participants throughout the workshop process. Entitled ‘Dare to dream’, this scenario opened the fourth and final scenario workshop.

Scenario 3: ‘Dare to dream’

The map of the region in 2022 shows clearly how the key infrastructure corridor that existed and was being developed a decade ago has been exploited and expanded as the core of a revitalised region. What existed only as a name on a few road signs and buildings in 2012 has become the central focus of activity, identity and pride within Gippsland region – Latrobe City. This vibrant new city stretches along much of the Princes Highway from Warragul to Sale. The highway, the rail line – now double-track and electrified along its full length – and the fibre-optic broadband network link the parts of the city and its air transport and logistics hubs at Morwell and Sale. The urban centres that existed 10 years ago as separate towns have developed as the key retail, office and cultural complexes of the city, while new industry, education and leisure developments and new residential developments have been strategically planned and located in what were the ‘spaces between’ towns.

Key to the implementation of the 2013 Gippsland Region Strategic Plan’s transport policy was establishment of the Dandenong Junction rail network control centre in 2015. The systems here enabled the coordination of Melbourne’s MTR and the region’s VTR passenger networks, with peak time InterCity services running express into Melbourne CBD, with the Latrobe City and Melbourne metropolitan services interlinking at Dandenong at other times. In addition, the new freight link to Port of Hastings was seamlessly integrated via the centre’s control.

Planning of new developments along the infrastructure ‘backbone’ of the region is focused on key nodes – incorporating existing and new rail stops, highway interchanges and other facilities into which new and upgraded ‘ribs’ are connected. These ribs run out at a tangent from the spine and provide communication and transport links to the wider Gippsland region. Within these areas, the key resource industries of the region have been networked according their individual needs, their inter-relatedness and their conflicting requirements. In line with the 2013 Plan, the agribusinesses, forestry, power, manufacturing and tourist sectors co-exist to the overall benefit of the region, the state and the nation.
With upgraded transport and communication links to the backbone, the suburb of Churchill has benefited from resort hotel development that supports the agritourism sector and that has enabled Monash University to become a major conference venue for the region and the state.

Latrobe City has established a reputation that brings not only pride to the regional community, but that is seen as the envy of other centres in Victoria and across Australia, many of which were ‘suffocated’ by their ties to existing key regional towns, rather than having this region’s advantage of ‘an existing skeleton, some vital organs, but with little flesh’. Welcome to Latrobe City, a centre of excellence for industry, culture, tourism, leisure and education. Pride of Gippsland, and nationally and internationally acclaimed.

Final review of key issues

From the discussion at Workshop 4, the following key issues were confirmed and noted as being of critical concern in the present. It is these issues that will determine whether the short- to medium-term decision-making, policy and planning for the region is grounded and effective.

- **Linking steps taken by government and the community to an aspirational future vision for the Latrobe Valley region:** To date the region has had large visions that are not accompanied by realistic and achievable smaller steps, or has had small steps that are not aspiring to a larger vision. Both approaches are ineffective and fail to achieve the outcomes that the region is hoping for.

- **Disappointment in standard of local governance:** There is a perception that the decisions of council lack leadership and are poorly communicated. There is also dissatisfaction with the limited capacity of government to undertake planning decisions, which are dictated by state overlays and characterised by local vested interests.

- **Absence of local leadership:** Participants are dissatisfied with the lack of leadership within the Latrobe Valley region. Most notable is the absence of a peak representative body for the region. For example, C4G is representative of business interests and its membership is entirely business-focused. There is a need for either an amalgamation of different representative groups or for representatives of these groups to work together more closely.
• **Parochialism and a lack of unity:** Relating to the issue of leadership is concern surrounding the degree of parochialism and divisions across the Latrobe Valley region. The community consistently fails to approach government with a united voice. This is a major limitation as the region tries to secure the commitment of governments to key projects.

• **Alternative funding models:** Participants raised the importance of looking beyond governments to consider other funding sources for major projects, particularly infrastructure. Superannuation funds, venture capitalists, social enterprises, and re-calibrated investment arrangements (e.g. Islamic Bank, MECU Bank, ME Bank) are funding avenues that could be considered. Business cases should be developed that are specific to these funding sources.

• **Improving the region’s media:** Local newspapers are perceived to be unreliable and irresponsible, contributing to divisions between towns and failing to be balanced on key issues. The internet may be a means of countering the traditional media sources.

• **Pride and local awareness:** The media could also be better harnessed to encourage pride in the region and awareness of its assets. The community itself needs to place higher value on what the Latrobe Valley region (and Gippsland) has to offer.

• **Lack of reflection in planning and strategies:** To date there has been a vast array of studies undertaken on the Latrobe Valley region. However, there has been little reflection on the strategies and approaches that have failed or succeeded in the past.

• **Lack of implementation of essential infrastructure plans:** There are few costed business plans for key projects in the region. There is also a lack of implementation on those plans that have been costed, including the Macalister Irrigation District 2050 Plan. This is despite the strategy being costed, with the dairy industry willing to contribute half of the money required for its implementation.
Appendix 3: Report on the global forest products industry

By Claude Rioux
Research Associate
Inter-University Research Centre of Globalisation and Work
Université de Montréal
cl_rioux@sympatico.ca

Emerging patterns for the global forest products industry (FPI)

The global FPI has been at a ‘turning point’ since at least the last ten years. Traditional markets are now mature. Large North American companies have been restructured, some after emerging from bankruptcy. Major Northern Europe companies have deployed to the southern hemisphere or made substantial efforts to enter in the Asian markets. Technology is moving from incremental improvements of existing processes to the technology and expertise needed to introduce, develop and manufacture new products, some being quite sophisticated. Environmental issues are now part of the business models.

Significant key factors are critical for the future of this industry:

- The available and sustainable wood fibre resources are limited.
- Natural forests are now a rarity in North America, Scandinavia and most of the developed and developing economies.
- Intensive silvicultural techniques in natural forests are favoured to replace the ‘natural’ stocks of wood, banking on a higher yield of growth.
- The concept of intensive silvicultural management approaches in forests located near communities is challenged by ‘social acceptability’.
- The plantations model is considered as a ‘strategic response to the limits of supply’ and must meet diverse sources of growing pressures in terms of social demand on its acceptability.
Such limitation has a considerable impact on prices and investment decisions.

There are strong pressures on at least three forest products traditional activities that were characteristics of the industry: printing and communication papers, pulp, and lumber. There is weak and declining demand for printing and communication papers in most industrialised countries. Brazil has become the ‘powerhouse’ of the pulp market, with implications for the pulp industry in other countries. Competition from imported lumber in developed countries is contributing to a shift towards more value-added products, particularly engineered wood.

Within such a context there is a need to adapt and develop alternatives. The range of products in the global FPI is expanding. Powerful drivers that encourage research and innovation are the limited supply of quality wood, and the costs to address this issue linked to the changes in the preferences of the users (such as the environmental issues and the demand for advanced new applications or materials).

Opportunities for the FPI

Globally, the FPI has distinct advantages that must be maximised. In particular, wood products can be considered to be ‘green products’. There is an intrinsic characteristic that supports this consideration: timber is a ‘carbon sink’. However these products must meet more and more rigorous criteria to be considered ‘green’:

- To value this characteristic and so differentiate wood from other materials, production activities and processes must display genuine practices and control in order to preserve the environment, from the early stages of forest management to the final stages of manufacturing and converting.

- Forests need to be certified. Most of the certification systems are good, but consumer preferences also play an important role in the selection of a certification process. For example, Forest Stewardship Council is often more valued by consumers, environmental advocacy groups and retailers. This is the path followed in Australia by APM, whose products are certified by PEFC, FSC, ISO 14001.
• Sustainability and ‘ecosystemic’ forest management approaches are highly valued and strengthen the perception of the consumers that wood products are green.

• Conservation/reduction of water use in industrial processes and choice of appropriate pulp beaching process can make a difference.

• Elementary chlorine-free pulp or paper can be considered as a basic standard; in some markets other processes are more valued, like peroxide or ozone beaching.

• Emissions are also critical to strengthen the perception.

• Sawmilling must be efficient, that means that the recovery rate form a log is optimised and that the residues have a second life.

There are four specific types of forest products where there is considerable innovation and improvement: biofuels/biorefining, lumber, pulp and paper. This report examines the trends for biofuels/biorefining and lumber.

**Biofuels/biorefining**

There is a strong interest in most of the producing countries to ‘value’ the biomass. The forestry biomass can be seen as a potential source of energy, and an industry in its own right with considerable market potential (Table 1).

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio-energy, bio-chemicals, fiber composites</td>
<td>505</td>
<td>776</td>
<td>1309</td>
</tr>
<tr>
<td>Conventional forest industrial products</td>
<td>495</td>
<td>512</td>
<td>545</td>
</tr>
</tbody>
</table>

Source: FP Innovations, 2011

Biofuels can be considered as a complement or perhaps as a substitute to more conventional or prevailing sources of energy like hydrocarbons or hydroelectric power. Many considerations must be addressed:

- The availability of the biomass. In the context of the production of energy there are limited sources of biomass. In old growth-forest it is possible to reclaim a certain quantity of dead wood (trunks and limbs and barks),
however the authorities must consider the role of the biomass in the forest’s ecosystem. Logging operations are a source of biomass, such as dead trees that must be cleared, the ‘culled’ timber, and the leftovers such as the limbs and tops of the trees (Table 2).

Table 2: Bioenergy Terminology Biofuels Classification

<table>
<thead>
<tr>
<th>Category</th>
<th>Woodfuels</th>
<th>Agrofuels</th>
<th>Others (including mixtures)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy crop – direct</td>
<td>Energy forest trees</td>
<td>Energy grass</td>
<td>Animal by-products</td>
</tr>
<tr>
<td></td>
<td>Energy plantation trees</td>
<td>Energy whole cereal crops</td>
<td>Horticultural by-products</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Landscape management by-products</td>
</tr>
<tr>
<td>By-products – direct</td>
<td>Thinning by-products</td>
<td>Straw</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Logging by-products</td>
<td>Stones, shells, husks</td>
<td></td>
</tr>
<tr>
<td>By-products – indirect</td>
<td>Wood processing industry by-products</td>
<td>Fibre crop processing by-products</td>
<td>Biodigester</td>
</tr>
<tr>
<td></td>
<td>Black liquor</td>
<td>Food processing industry by-products</td>
<td>Slaughterhouse by-products</td>
</tr>
<tr>
<td>End-use materials –</td>
<td>Used wood</td>
<td>Used fibre products</td>
<td></td>
</tr>
<tr>
<td>recovered</td>
<td></td>
<td>Used products of fruits and seeds</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kitchen waste sewage sludge</td>
</tr>
</tbody>
</table>

Source: FAO, 2010

- One of the important source of biomass comes from the sawmilling process at the stage of ‘debarking’, and from the residues that come out through the remaining stages of sawmilling, including sawdust, shavings and substandard quality products.

- Some bioenergy projects get their supply from woodchips. It entails that the promoters must make an important economic choice related to the quality of the chips. Using high-density fibre is considered as suboptimal.

- Building power generation stations or plants may take diverse forms:
  - Stations can be built to generate electricity on a commercial basis, the electricity being sold to the operator (s) of the grid system.
  - Stations can also be built in order to supply specific activities with power and steam. This is the case of the cogeneration model, which is now frequent within the forest products industry. For example, in the case of Kraft pulping the main source of energy can be steam produced in the
recovery boilers. Thermomechanical pulp refining can provide energy to produce mechanical pulp based products such as newsprint. Burning wood residue is a significant source of energy for timber sawmills. These cogeneration systems are integrated to the mills, and if they can produce more power than is needed for the purpose of manufacturing, the surplus can be sold to the grid.

- Some stations are dedicated to supply power and steam as buildings' heating sources. There are such stations in Canada and Scandinavia. In these cases, biofuel is sourced from wood residues or from domestic / industrial waste.

  - There is a strong interest to bio refining:
    
    - This is one of the pathways identified by FP Innovations in Canada. The mill is considered not only as a pulp or paper manufacturing facility but also as a producer of numerous co-products that can be extracted from the lignin.
    
    - An interesting case is the Tembec’s pulp and paper mill at Temicaming in Canada. The lignin / lignosulphate recovered from pulping is transformed into resins that can be used to make composite industrial materials, or in food processing such as industrial vinegars.
    
    - The APM mill at Maryvale is also an interesting example as the salt cake is recrystallised and used by the soap and glass industries.

  - A new ‘field of products’ is currently being investigated and there are cases where products are at the stage of ‘industrial demonstration’:
    
    - This field is related to the ‘nanoproducts’ and ‘nanotechnologies.’
    
    - There is substantial research now conducted in laboratories to develop ways of using wood fibres as an advanced material. Such research is well advanced for example in Sweden, Canada and the USA.
    
    - Numerous promising applications come out the nanoproducts that can be derived from the production of pulp.
Nanocrystalline cellulose is one of the nanoproducts developed by FP Innovations and its network of scientists at Canadian universities (McGill, Polytechnique etc.). The particular properties of nanocrystalline cellulose enable a wide variety of applications:

- Physical: Polymers, composites, papermaking, packaging, textiles, sealants.
- Chemical: Varnishes, paints, glues, hydrogels, biocide dispersion.
- Optical: Security papers, pigments, filters, packaging, cosmetics.
- Electrical: Conducting Papers (micro and nano electrical).

In February 2012, Canadian company Domtar started the first industrial demonstration plant for nanocrystalline cellulose production at its Windsor UFS Mill in the Province of Québec. The plant is located on the mill site and has a capacity of one tonne per day. The nanocrystalline cellulose is produced from NBSK (northern bleached Kraft softwood pulp). Built at a cost of $42.6 million (CAD), the plant is a partnership of Domtar and FP Innovations under the company ‘Cellulforce’. It employs 30 highly skilled persons.

The financing for the project was as follows:
- $23.2 million (CAD) Natural Resources Canada
- $10.2 million (CAD) Ministère des ressources naturelles et de la faune (Québec) (Ministry of Natural Resources and Fauna of Québec)
- $9.2 million (CAD) private partners.

Cellulforce have commissioned research at universities to develop applications such as:

- NCC in adhesives
- NCC for high-performance textiles
- NCC for automotive applications
- Protection of food product
- NCC in personal home care and coating / biomedical systems
- Pharmaceutical applications

**Lumber**

Most of lumber is traded as a commodity. However after WWII, numerous products were developed that valued important characteristics of wood. Structural panels such as oriented-strand board (OSB) and plywoods, structural systems such as l-
Joists, LVL (laminated veneer lumber) beams, lintels (beams at the top of a door or window) were introduced on the housing building markets.

Quite recently, there have been efforts to introduce timber made products into the commercial and industrial building markets. Traditionally, most of wood products were limited to small-sized buildings. New products are now on the marketplace to serve ‘fully’ the building markets.

Stora-Enso, one of the world largest forest products companies, includes in its products portfolio ‘advanced’ engineered wood products. The ‘cross-laminated timber’ (CLT) panels are used as walls and floors in buildings up to nine storeys high. Made out of ‘epicea’ these panels offer all of the characteristics needed for solid and safe construction. In Canada, Chantiers Chibougamau manufacture and market under the brand name ‘Nordic Lam’ a full line of products: laminated beams, ark-spans, columns and CLT panels that can be used as ‘construction systems or solutions’ in small and medium-sized buildings like sports facilities, office buildings, bridges, warehouses, residential buildings, and apartment buildings.

These products were developed with the assistance of FP Innovations and two universities: Laval University in Québec City and the University of British Columbia in Vancouver. In addition to research support, special efforts must be devoted to motivating communities of builders, structural engineers, interior designers, architects and regulatory authorities to consider these products in their projects and to make the necessary adjustments to the building construction codes.

FP Innovations has produced a comprehensive manual for all manufacturers and professionals involved in a project using these timber products. The manual includes specifications for the CLT range, regarding deflection, vibration, creep deformation, load tables and fire protection.

These products are made of softwood lumber; some sections of spans, columns and beams for example must be made with high-density wood of the best quality.

**Conclusion: Pathways to establish an innovative FPI**

Two main ‘ingredients’ can encourage and foster an innovative FPI:

1. Moving from the dominant commodity model to a more value-added model. This does not mean that a solid commodity market model cannot get a good economic performance; there are companies that are doing well by being
leaders in their markets because they are efficient. Their costs are under control and they use limited resources in an effective manner: recycling and diminishing the use of water, effectively using their energy, working with state of the art technologies, and making the best use of their supply of fibres. However, it seems that there is momentum in the industry to be more innovative.

This momentum must be encouraged by government but also by other stakeholders. Innovation carries risks and rewards. This means that an appropriate institutional setting can reconcile different interests, that is those of the business community, environmental advocacy, farming, unions, end users. There is also a need to provide capital to develop projects and to encourage research and development through appropriate public policies.

The ‘Celluforce’ project has benefited from such institutional settings. The participation of FP Innovations, which is sponsored by the public authorities and the industry, is critical since it opened opportunities for Domtar to engage in a completely new line of business. FP Innovations is at the centre of an extensive network of top researchers working at Canadian universities and at the labs of Natural Resource Canada and the National Research Council of Canada. It is a body with the capacity to facilitate research and expertise in design products and processes, as well as to set appropriate product standards.

2. Going to these innovative products depends on the guarantee of an adequate supply of quality fibre. The models are well known. The techniques and institutional and organisational knowledge are constantly expanding. Together they contribute to ‘better forestry’, and a forest products industry that is both sustainable and economically viable.

References


FP Innovations (2011), ‘The Role of Innovation in the Canadian Forest Sector Transformation’, Presentation to the Forest-Based Sector Technology Platform, 26 September 2011, Warsaw, Poland.
Appendix 4: Full interview schedules

Schedule 1: Management / Human relations interview/survey

Company:
Address:
Interviewee
  Name:
  Age:
  Gender:
  Job Title:
  Phone Number:
  Length of Service:
  Qualifications:
Interview Venue:
Date:

PART 1: THE COMPANY

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
  Sales
  Clerical
  Trades (electricians, servicing, maintenance, distribution)
Trainees: Graduate
  Apprenticeships/traineeships
  Other

Other occupations (please specify)

Q.4. What proportion of the workforce in this area of the company are:
   a. women ?
   b. from ethnic categories (define) ?

Q.5. What proportion of the workforce in division/company:-
   a. are over 50 years old ?
   b. are under 30 years old ?

Ask for more details

Q.6. What percentage of the workforce is:
   a. Permanent (numbers / %)
   b. Fixed term
   c. Temporary
   d. Labour Hire
   e. Casual
   f. Other (specify)

Q.7. What percentage of the workforce are under awards, enterprise agreements or individual contracts:
   a. Awards
   b. Enterprise agreements
   c. Individual contracts

Q.8. Have people been recruited over the last 12 months? If so, in what occupational areas?

Q.9. What change do you expect to see in employee numbers over the next 5 years? Distinguish by occupational category.
PART 2: SKILLS PROFILES AND 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? If so, in what ways and for what major reasons?

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 (e.g. by qualifications)?

Q.8. Do you tend to recruit workers with a particular work experience and background? (probe: from the industry, from the local region, from diverse work experiences, etc.)

Q.9. Does the age profile of your current workforce matter? If so, in what ways?

Q.10. Does your organisation engage in workforce planning? If so, what does it involve?

PART 3: TRAINING

Q.1. What training is offered by the company? On average how many hours per month is allocated to training?
   a. Is the training delivered by company trainers or outsourced to another provider, like a college or industry association?

Q.2. Do any of the training programs that the company funds and organises, lead to a nationally recognised qualification? Please give me some examples.
PART 4: FUTURE DEVELOPMENTS

Q.1. Where do you perceive the greatest opportunities for your business?
   a. What is required to realise these opportunities?
   b. What would be the timeframe required to achieve these opportunities?

Q.2. What do you perceive to be the major challenges for your business in the years ahead (2-5 years)?
   *Probe: Ownership [State, Municipal, National, International] implications for skills development*
   a. How are these challenges likely to impact on this company?

Q.3. What steps should the company take to address both the opportunities and challenges?

Q.4. Is there anything that governments [Local, State or Federal] could or should do to assist your company in meeting these opportunities and challenges?

PART 5: FUTURE DEVELOPMENTS AND TRAINING IMPACTS

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. 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:
   a. Will changes in the production process affect the gender, age, disability and ethnic background profile of your workforce?
   b. Will changes in the organisation of work affect the gender, age, disability and ethnic background profile of your workforce?
   c. Will changes in the credential and skill requirements affect the gender, age, disability and ethnic profile of your workforce?
   d. Will the ageing of the workforce affect the profile of your workplace?
Q.5. 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:
   a. **existing** employees and their development
   b. **future** employees (apprenticeships, traineeships, graduates)

Q.6. 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.7. What could outside agencies do in order to help you meet the demands of the sector more effectively in terms of:
   a. re-skilling and upskilling existing employees
   b. training and qualifying future employees

Do you currently have links or ongoing relationships with particular providers?

Q.8. Is there anything that governments (State or Federal) could or should do to assist training needs?

Q.9. What is the major difficulty that your company is likely to face over the next five /ten years in realising its skills requirements?

Q.10. Is there anything else that you would like to add?

THANK YOU
Schedule 2: Union interview

Union:
Address:
Interviewee:
   Name:
   Age:
   Gender:
   Job Title:
   Phone Number:
   Length of Service:
   Qualifications:
   Union Position:
   Length in this Position:

Interview Venue:
Date:

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. 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.

Q.8. Are the skills found among your membership transferable to a range of different industries and occupations?
   a. If they are relatively transferable what sort of assistance and/or retraining might workers need to transition to another industry or occupation?

PART 4: TRAINING

Q.1. How would you describe the training by the industry available to your members in the industry?

Q.2. Are you aware of any particular difficulties in attracting people with the right skills and qualifications into the industry?

Q.3. Are you aware of any problems in the industry in relation to skills training and retraining (e.g. number of programs available)? Please give me some examples.

Q.4. 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.9. What do you think will be the training requirements for Latrobe Valley workers for the next five/ten years? How should this training be delivered?

Q.10. What types of training might be needed for potentially displaced power industry workers?

Q.11. Is there any other sort of assistance that these workers might need?

Q.12. Is there anything else that you would like to add?

THANK YOU
Schedule 3: Employee interview

Company:
Address:

For Each Interviewee:

Name:
Age:
Gender:
Job Title:
Ethnicity:
Area of Plant/Sector in which you work:
Length of Service:
Qualifications gained (dates):
Other industries and occupations they have worked:

Interview Venue:
Date:

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. Has the skills profile changed over the last five years and in what ways?

Q.4. 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 one you are currently involved where you might explore future job opportunities? (i.e. 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?

Q.2. What training takes place in the plant and how is it done? Can you give some examples of training you have undertaken?

Q.3. Is there an opportunity to do training offsite? If so, where, with whom? Have any of you taken part in this type of training (examples)

Q.4. Are you satisfied with the training that you have received since you began work here? Why? / Why not?

Q.5. What changes are beginning to happen in your areas of work, which may affect your training needs?

Q.6. What type of training would help you develop skills that are recognised by other employers?

PART 4: FUTURE DEVELOPMENTS

Q.1. What do you think are the likely changes in the industry over the next 5 / 10 years?

Q.2. 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?

Q.3. Will these changes alter the skills profile in the company? (for example, will you need more or less multi, semi, unskilled workers?)
Q.4. Are the credential/qualification requirements of the company likely to change? In what ways?

Q.5. 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:

a. existing employees and their development

b. future employees (apprenticeships, graduates)

Q.7. Are there any other points that you would like to make?

THANK YOU
Schedule 4: Employees interview (Focus group)

Company:
Address:

For each interviewee:

Name:
Age:
Gender:
Job Title:
Area of Plant/Sector in which you work:
Length of Service:
Qualifications on entry (dates):
Training done since beginning work here (dates):
Qualifications gained (dates):

Interview Venue:
Date:

Group Questions

Q.1 How would you describe the skills required for your jobs?
Q.2 How would you describe your own skills?
Q.3 How important are qualifications for meeting skills requirements for your jobs?
Q.4 How important are qualifications for your job? (examples)
Q.5 What changes are beginning to happen in your areas of work, which may affect your training needs?
Q.6 In the light of the changes which are occurring in the sector, what skills do you think you will require?
   a. In the light of the changes which are occurring in the sector, what further skills training do you think would be appropriate for you?
Q.7 What training takes place and how is it done? Can you give some examples of training you have undertaken?
Q.8. 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.9. By what mode would you prefer this training to be provided?
   a. Off the job?
   b. On the job?
   c. By any other mode?

Q.10. Do you think your skills are transferable to other industries? If yes, what?

Q.11. What type of training would help you develop skills that are recognised by other employers?

Q.12. Are there any other points that you would like to make?

Q.13. Have you ever considered applying for other jobs? (If yes, please explain)

Q.14. Do you think you might need to consider other jobs in the future? (If yes, please explain). If so what training might you require?
Schedule 5: Agencies/organisations/expert interviews

(Future developments and skill needs)

Company/employer:

Address:

Interviewee:
  Name:
  Age:
  Gender:
  Job Title:
  Phone Number:
  Length of Service:
  Qualifications:

Interview Venue:

Date:

PART 1: FUTURE DEVELOPMENTS

Q. 1. Where do you perceive the greatest economic opportunities for the Latrobe Valley region?
  
a. What is required to realise these opportunities?
  
b. What would be the timeframe required to achieve these opportunities?

Q. 2. What do you perceive to be the major challenges for Latrobe Valley region in the years ahead (2-5 years)?

Q. 3. What steps should the region take to address both the opportunities and challenges?

Q. 4. Is there anything that governments (State or Federal) could or should do to assist the regional economy in meeting these opportunities and challenges?
PART 2: FUTURE DEVELOPMENTS AND SKILL NEEDS

Q.1. Will these changes alter the skills profile of the sector? (for example, will there be a need for more or less multi, semi, unskilled workers?)

Q.2. Are the credential/qualification requirements likely to change over the next five years? In what ways?

Q.3. Is it likely that the Latrobe Valley region will have more or less need for people with other generic skills over the next five years (e.g., Communication, leadership, problem solving)? Can you give me an example?

Q.5. Do you think that changes in the region over the next five years will have an impact on the nature of the sector workforce? For example:

a. Will changes in the economy affect the gender, age, disability and ethnic background profile of the workforce?

b. Will changes in the economy affect the gender, age, disability and ethnic background profile of the workforce?

c. 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 region’s companies will have to change the nature of their training strategies over the next five years in order to meet the demands of the changing economy? In what ways do you think training strategies will need to change in order to meet the needs of:

a. **existing** employees and their development

b. **future** employees (apprenticeships, graduates)

Q.7. Do you think that the prevailing modes of training will need to be changed or are likely to change over the next five years? Why?

Q.8. Do you think that outside agencies like schools, TAFE, universities and other training providers are equipping individuals with the skills and qualifications that are required by the changing economy?

Q.9. What could outside agencies do in order to help meet the demands of the economy more effectively in terms of:

a. re-skilling and upskilling existing employees
b. training and qualifying future employees

**Q.10.** What is the major difficulty that companies are likely to face over the next five/10 years in realising their skills requirements?

**Q.11.** How successful do you think companies are likely to be in meeting their skills requirements over the next five/10 years?

**Q.12.** Is there anything else that you would like to add?

THANK YOU
Identification of opportunities to support Structural Adjustment in the Latrobe Valley

Prepared by
The Centre for Sustainable Organisations and Work

Prepared for
The Commonwealth Department of Regional Australia, Local Government, Arts and Sport

Centre for Sustainable Organisations and Work
RMIT University
GPO BOX 2476
Melbourne, Victoria, 3001, Australia.
Tel (61) 3 9925 5940
Fax (61) 3 9925 5960