Deloitte Access Economics

Transition Illawarra initiative: Stage One

Regional Development Australia - Illawarra

FINAL REPORT

17 December 2013

Deloitte.

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17 December 2013

Dear Natalie

Transition Illawarra initiative: Stage One

Deloitte Access Economics has been contracted by Regional Development Australia (RDA) Illawarra to undertake a comprehensive research project of the Illawarra economy. The research forms the first stage of the Transition Illawarra Initiative.

The Transition Illawarra Initiative is being led by RDA Illawarra for the purpose of identifying and promoting economic diversification in the Illawarra region. The work is guided by a Stakeholder Group, formed from the existing Illawarra Taskforce.

There are seven distinct elements of this research project:

- a review of existing research, initiatives and strategies;
- a review of the Illawarra economy, including the industry structure;
- a competitive analysis to consider how the Illawarra economy fits in a national and global perspective;
- an analysis of the region's future workforce profile;
- a supply chain analysis of the top two emerging and developing sectors;
- analysis of infrastructure requirements based on evidence-based growth opportunities; and,
- recommendations and strategies.

This report represents the final report as part of this project. It incorporates feedback on earlier draft reports received from both RDA Illawarra and the broader Stakeholder Group.

I hope this analysis will prove useful to RDA Illawarra in implementing the coming stages of the important Transition Illawarra initiative. Please do not hesitate to contact me if we can be of any further assistance.

Yours sincerely,

David Rumbens
Director
Deloitte Access Economics Pty Ltd

Contents

Charts

Tables

Figures

Glossary

ABS	Australian Bureau of Statistics
DAE	Deloitte Access Economics
ICT	Information and Communications Technology
LFR	Labour Force Region
LGA	Local Government Area
NBN	National Broadband Network
NEIS	New Enterprise Incentive Scheme
NSW	New South Wales
PEA	Priority Employment Area
OECD	Organisation for Economic Co-operation and Development
RDAI	Regional Development Australia Illawarra
SLA	Statistical Local Area
SME	Small to Medium Enterprise
SR	Statistical Region
UOW	University of Wollongong

Executive Summary

Deloitte Access Economics has been contracted by Regional Development Australia (RDA) Illawarra to undertake a comprehensive research project of the Illawarra economy. The research forms the first stage of the Transition Illawarra Initiative. Further stages will build on the evidence base provided in this report.

The Transition Illawarra Initiative is being led by RDA Illawarra for the purpose of identifying and promoting economic diversification in the Illawarra region.

Illawarra economic profile

RDA Illawarra defines the Illawarra region as consisting of three local government areas (LGAs): Kiama, Shellharbour and Wollongong.

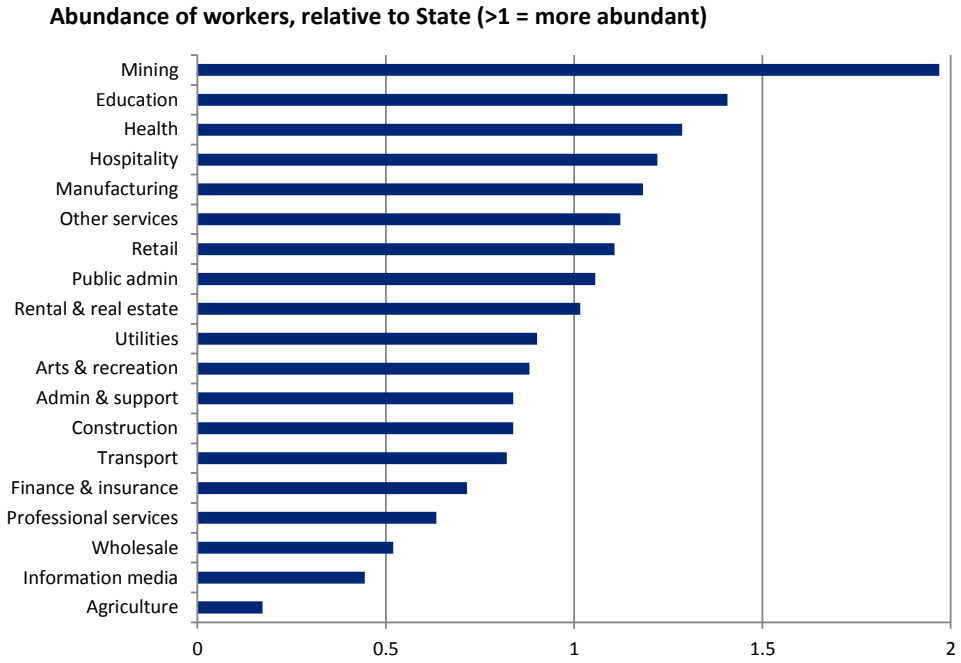
The Illawarra is a region which has experienced relatively slow economic and population growth for some time. The Illawarra region recorded average annual population growth over the five years to 2011-12 of 0.6%. That compares to growth of almost 1.2% in New South Wales and almost 1.8% in Australia.

The Illawarra's unemployment rate has been higher than the State average since the late 1980s (from when consistent data are available), and its labour force participation has been consistently lower.

In brief, the Illawarra's workforce is comprised of a relatively high share of 'blue collar' occupations such as labourers and technicians, and a lower share of highly skilled occupations such as professionals and managers.

The industry with the greatest degree of over-representation in the Illawarra relative to NSW is mining. This is followed by education, given the notable role of the University of Wollongong, and health care, given the region's relatively older demographic. Hospitality and manufacturing are also over-represented within the Illawarra region. IT services, professional services and finance and insurance all have representation well below the State average.

Chart i: Industry intensity, Illawarra relative to NSW



Source: 2011 Census

The region's slow population growth and workforce growth have also kept Illawarra housing values relatively low compared to other regions. Despite high house prices in certain suburbs, the Illawarra has traditionally been amongst the more affordable regions in NSW to buy a house, certainly when compared to many parts of Sydney.

The Illawarra's regional plans from RDA Illawarra and NSW Government agencies focus on economic development, infrastructure, communities and the environment. Over time, there has been a shift in emphasis away from business attraction towards a greater focus on attracting people and skills to regions.

A number of major regional development strategies currently exist for the Illawarra, including the:

- Regional Action Plan for the Illawarra, from the NSW Department of Premier and Cabinet;
- RDA Illawarra Regional Plan 2010-2015; and the
- Illawarra Regional Strategy, from the Department of Planning and Infrastructure.

In general, the priorities identified in each of these regional plans can be can be classified into four main themes:

- economic development;
- infrastructure improvements;
- community development; and,
- environmental sustainability.

Future economic drivers – the rise of Asia

Looking forward, expectations of the future path for the Illawarra's economy cannot be formed in isolation from the broader economy.

Many of the key trends seen across the Australian economy will also be of relevance to the Illawarra, and there is no more significant trend than the continued economic rise of Asia – what has been dubbed the 'Asian century'.

While growth rates may not be achieved evenly over time, it is expected that global economic growth over the next decade will be dominated by China and India, with other emerging Asian markets such as Indonesia, the Philippines and Malaysia also making strong contributions.

But the nature of Asia's economic growth is also changing. As Asia becomes more prosperous, its burgeoning middle class will want better housing, higher quality food, a sound education, more holidays and a better environment. Those new opportunities cover a range of sectors.

The Illawarra region is well positioned to meet these new demands. **Port Kembla** for example is the State's largest grain exporter and the third largest in Australia, and is well positioned to take advantage of a rising demand for grain. The **University of Wollongong** is already a major provider of international education, with approximately 40%of its student base being international students. [1] And finally, the region's natural amenity combined with its close proximity to Sydney mean huge opportunities to tap into the **growing Asian tourist market**.

That said, important challenges exist. Despite the potential for an expansion of other forms of trade, coal remains the key player, and the outlook for coal demand is clouded with uncertainty. In this regard the Illawarra region also faces intense competition from other ports, with the vast majority of current coal investment being undertaken in Queensland and the Hunter coal fields. Also, uncertainty exists over the profile of China's growth in coming decades.

Future economic drivers – an ageing population

Australia's population is ageing at a rapid rate, and that is particularly true for the Illawarra.

The **Illawarra's dependency ratio** (the ratio of population over 65 to working age population aged 15-64 years) is estimated to be 26%, rising to 39% over the next twenty years. NSW's dependency ratio is estimated to be 23%, rising to 32% over the next twenty years.

On average, people on retirement incomes generally have lower incomes than the working-age population, so a higher share of retirees means a lower average income for the Illawarra region looking forward. Those incomes may also be more dependent on factors

[1] This figure represents total enrolments. The UOW has campuses throughout the South Coast region, two in Sydney, as well as one in Dubai. The available data do not show enrolments by campus.

occurring outside the region, such as decisions on the aged pension, and the performance of superannuation funds and other investments.

But there are also opportunities which open up as a result. As the population grows older, it will demand a greater level and range of **health services** including hospital and other medical treatment, as well as aged care services such as meals on wheels, community services and residential care (which may be broadly termed 'health care'). Strong employment growth is expected here over the next 20 years, with potential for the region to become a 'centre of excellence' in such service delivery.

With more and more of the future workforce likely to be employed in health care, it follows that **education in the health care sector**, both tertiary and vocational, represents a key opportunity for the region.

Future economic drivers – technological change

Failure to adapt to the digital transformation sweeping the economy has the potential to leave businesses both without a customer base and with a higher cost structure.

While the retail sector is generally front of mind in relation to digital trends, the truth is that most Australian workplaces are going to be affected in some form over the next few years. Many of the sectors most likely to drive the Illawarra's economy looking forward are also amongst the sectors most exposed to digital disruption – that is, professional services, health care, education and finance. Adapting to digital transformation is therefore especially important for the Illawarra's economic future.

Heavily regulated sectors such as education, health, utilities and transport also face large amounts of digital disruption, but the regulated nature of these sectors means change will come slower.

In line with these trends, IT services are seen as holding key opportunities for the region. The University of Wollongong (UOW) has the fourth largest IT student intake in Australia, but the majority of these students do not remain in the region upon completion of their studies.

While the UOW's Innovation Campus offers promise, the Illawarra region faces significant competition from larger and well established IT precincts in Sydney.

Teleworking has the potential to significantly affect the Illawarra region's current business model. By expanding the pool of potential jobs for Illawarra residents, teleworking means that many talented locals no longer need to leave the region in order to find a job. As teleworking becomes more and more commonplace, people will have a greater capacity to find their 'ideal' job, which will ultimately lead to both productivity and workforce participation benefits.

Future economic drivers – business/industrial development

The Illawarra region has, and will likely continue to have for some time to come, a relatively high share of its economy in the mining and manufacturing industries.

But despite the region's traditional (and continued) reliance on blue collar industries, it is clear that some diversification is beginning to take place, with a greater emphasis on the services sectors today relative to ten years ago, and with that trend looking set to continue.

Facilitation of new business growth is important for a region undergoing structural change, and **small businesses** will play a key role in this. There are many small business assistance programs, all of which are aimed at alleviating (or if possible, eliminating) one or more of the barriers faced by small businesses in seeking to expand. These barriers can be broadly classified as cost, workforce, information, and funding.

Future economic drivers – Sydney's future growth

With Sydney's population continuing to grow and higher rents and housing values ensuing, opportunities exist for the Illawarra to position itself as an alternative place to live. This trend may be intensified as technological change increases the capacity to work from home and/or as transport links between Sydney and the Illawarra improve.

Almost 30% of employed Illawarra residents travel outside of the region for work. Such a high share of commuters is often viewed as a negative for the region – if 30,000 Illawarra residents commute outside of the region for work, some argue that this reflects an inability of the region to create sufficient jobs for 30,000 people.

However, this argument ignores the broader gains that can be made both to the Illawarra region and the economy as a whole by its workers going to where their skills are best utilised. It is also likely to be true for many Illawarra residents working in Sydney that the most relevant alternate case is not that their job would be instead located in the Illawarra – it is that the worker would instead reside in Sydney, or another part of Sydney's hinterland which competes with the Illawarra.

The Illawarra is in direct competition with regions such as the Central Coast and Hunter, as well as southern regions of the greater Sydney metropolitan area such as the Sutherland Shire, in vying to attract workers and businesses connected with Sydney.

This is not to say that the region should not seek to expand its own workforce – a growing workforce is, after all, a key driver of economic growth. In a number of industries the Illawarra has strong potential to establish itself as a key focal point – health, education, and transport, for example. But the Illawarra's proximity to Sydney means a sizeable share of its workforce will always commute to Sydney.

Another potential opportunity for the region resulting from its proximity to Sydney is in expanding its **tourism** sector. Tourism is a relatively small industry in the Illawarra, especially given its natural amenity and its proximity to Sydney. A common view among stakeholders is that the Illawarra region has considerable potential to increase tourism, but that a lack of infrastructure is holding it back.

For the region to truly take advantage of its proximity to Sydney, it needs a strong **housing market**, which will generate both demand for housing (through the provision of affordable housing), as well as a solid employment base through the construction of new housing.

Finally, a stagnant **office market** hinders the Illawarra's capacity to truly capitalise on its proximity to Sydney. As Sydney grows and CBD office space becomes more and more expensive, marginal firms will spill out of the CBD. But currently, suburban Sydney markets seem a more attractive possibility to prospective commercial tenants than Wollongong.

The Illawarra's future workforce

Over the next 20 years employment growth In the Illawarra is expected to average 0.5% per annum, compared with 1.0% for New South Wales as a whole.

In part these projections have a demographic dimension, with the average age of Illawarra residents expected to increase more rapidly than the State average, limiting the rate of population growth.

They also have an industry dimension. The region remains over-represented in the manufacturing and mining sectors, which may see employment declines and only modest growth respectively going forward.

At the turn of the century **manufacturing** accounted for some 20,000 jobs in the Illawarra region, a figure that has shrunk to around 12,000 (as of June 2013). This decline is expected to continue throughout the projection period, with the manufacturing sector expected to shed around 4,000 jobs over the next twenty years, the equivalent of 3% of the Illawarra's current workforce.

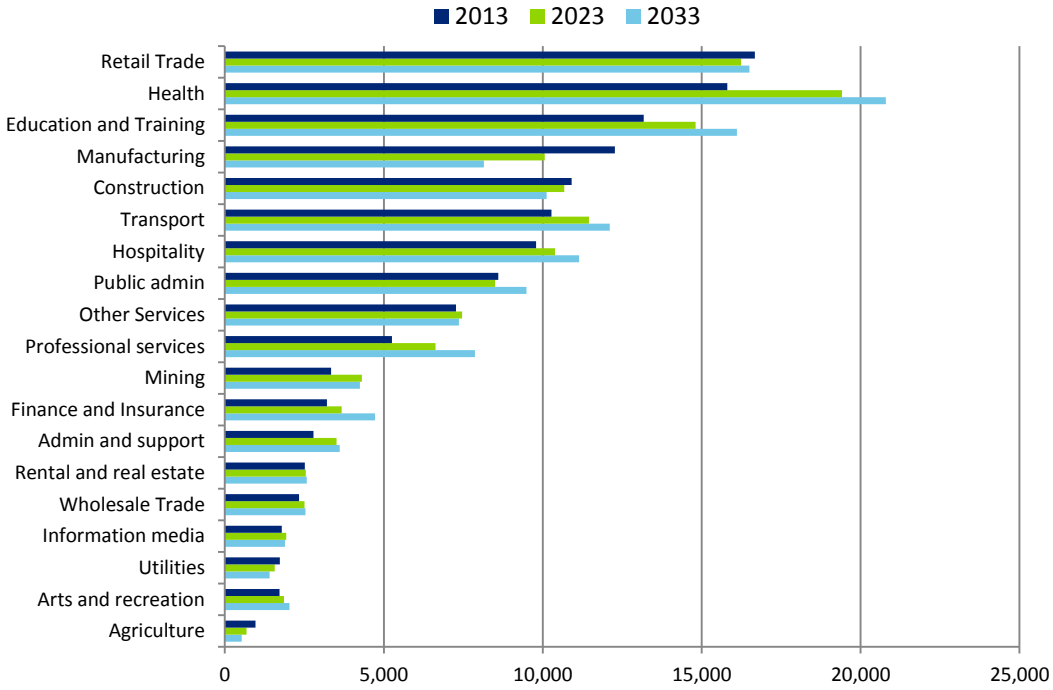
That said, the level of manufacturing output is expected to keep rising over time, with that output growth driven largely by productivity gains. It is also likely that there will be some niche areas within manufacturing where employment growth is seen over time.

The fastest growing sector over the next twenty years is expected to be **health care**, driven primarily by an ageing population, with the sector's workforce expected to grow by the equivalent of nearly 4% of the region's total employment base over the next twenty years. **Education and training** is also expected to grow strongly, by around 3,000 workers over the next twenty years, driven primarily by continuing strength of the region's vocational and tertiary education offerings.

Strong growth is also expected in the services sectors, with **professional and administrative services** leading the pack in terms of average annual growth over the projection period. **Hospitality** employment is also expected to grow reasonably strongly.

Finally, the **transport** sector is expected to see strong growth over the period, of around 2,000 workers and with an average annual growth rate nearly twice the regional total. Two key trends loom positive for the transport sector over the projection period – first, the expectation of additional coal exports through Port Kembla in the short term, followed by potential longer term switching into containerised trade and other exports.

Chart ii: Illawarra employment by industry, 2013, 2023 and 2033



Source: ABS 6291; Deloitte Access Economics

On an **occupational** basis, there are some notable differences in rates of employment growth expected in the Illawarra over the next two decades. Professionals, community and personal service workers and managers are expected to dominate overall employment gains, with strong rates of growth seen over the 20 year period.

Overall, the areas of strongest labour demand are generally also expected to be areas where there are **high skill requirements**. That highlights the importance of continued skills development. A longer term lens should be applied to the skills task, so that the rate of skills development does not fall off, for example, through periods of cyclical weakness.

Infrastructure needs

This report provides an overview of infrastructure projects which have been proposed for the region. Importantly, it does not provide a detailed cost-benefit analysis for any specific project and governments should undertake such an analysis before pursuing any of the projects outlined here.

Transport infrastructure plays an important role in improving accessibility in a region and connecting residents to employment, education and social opportunities.

For example, additional investments in the rail network can not only potentially increase the attractiveness of the region and support population growth, but can increase participation by making it easier for individuals to access employment. Reducing traffic congestion can similarly lead to increased freight productivity by reducing transport times and lead new firms to choose to relocate to a region, boosting local demand for goods and services.

In choosing which transport projects to prioritise in the region it is important to have an understanding of the longer term drivers of transport demand in the region. Key drivers are:

- accommodating the growth of Port Kembla;
- providing transport links to future housing estates in West Dapto and Calderwood; and
- accommodating population growth in the region and the growth of commuters (to Sydney) over time.

The **expansion of the outer harbour at Port Kembla** will result in growing road and rail freight over time. The Port has already commenced the first stage of reclamation works to build the outer harbour, although the reclamation project could take several decades to complete.

The growth of Port Kembla will strengthen the case for the construction of the Maldon to Dombarton rail link. Transport for NSW is currently re-evaluating the case for the Maldon to Dombarton line, which is likely to depend significantly on the degree of growth in activity at Port Kembla.

Utilities infrastructure, namely water, electricity, gas, waste and telecommunications, play an important role in supporting new residential developments, industrial estates and office buildings in the region.

The Illawarra region has significant electricity needs as a result of its dependence on heavy manufacturing including steelworks and mining. However, the relative importance of the manufacturing sector in the region has progressively declined in recent decades, which is likely to result in reduced demand for electricity and natural gas over time.

Another key utility infrastructure that the region will need in the future if it is to continue to focus on innovation and attract business investment is **broadband infrastructure**. The national broadband network (NBN) has already been delivered in parts of Kiama and is under construction in some parts of Wollongong. Ensuring that the region has access to broadband infrastructure and ensuring that it is provided to new housing estates is likely to assist in attracting businesses to the region. It would also assist in promoting telecommuting and the delivery of online health services to the region's ageing population.

Health, social services and education are key components of what is often referred to as 'soft' infrastructure. These components are critical to supporting the welfare of the Illawarra community and supporting economic development and the growth of human capital in the region.

Many of the region's hospitals are also currently experiencing relatively high levels of overall demand. In the longer term, an ageing population will increase the demand for health care in the region, particularly for Wollongong Hospital. However, there is limited scope for the hospital to expand on its existing site. The limited scope of the hospital to expand highlights the need to explore the potential for establishing a new hospital in the region over the longer term.

The demand for tertiary education infrastructure is also expected to grow, driven by both domestic and international enrolments.

Supply chain for key sectors

This report provides an examination of supply chain linkages for two key growth sectors for the Illawarra – professional, scientific and technical services (professional services), and health care and social assistance (health care).

Professional services in the Illawarra are expected to see rapid employment growth over the coming years. This will be supported by technological change and teleworking, which will provide new opportunities for professional services delivery in the region, as well as opening up new sources of competition for those services.

Health care is expected to be the largest contributor to employment growth in the Illawarra over the next two decades, driven by the ageing of the population, and a potential influx of retirees from Sydney. There is significant scope for digital trends such as telehealth or the remote delivery of health services to impact the industry over time.

For both these sectors the bulk of economic activity is generated by operations within each sector, with the flow on (indirect) impact smaller. The direct value added of sample firms made up between 66% and 77% for health care firms and 78% for professional services firms. This is somewhat unsurprising as these industries are labour intensive. Most of their economic impact is local.

The main purchasers of health care are consumers, with 59% of expenditure on health care undertaken by governments, and 37% by households. Only 3% goes to other industry use. This implies that the health care sector's performance will be driven by consumers and that government policy decisions will have a big impact on the size of the sector.

Unlike health care, the main consumers of professional services are other businesses. This makes up around 95% of total expenditure on professional services. The biggest consumers of professional services are the professional services sector itself, along with construction and manufacturing.

Given the fact that the primary consumers of professional services are other firms rather than the government or final consumers, this implies that the performance of this sector would be heavily affected by the performance of the broader economy. The business cycle would play a significant role in determining the performance of these firms.

Geographic analysis suggests that the benefits of growth across professional services and health care will primarily remain in the Illawarra region. Thus these industries have significant potential to influence the economic development of the region.

Conclusions

A number of opportunities exist to support economic development in the Illawarra region.

Many of these will continue to revolve around traditional areas of strength for the region in mining, manufacturing and transport.

But over time the region has also been undergoing structural change, and this is likely to continue to occur, with a greater proportion of activity being devoted to sectors such as health care, education and training, professional services, finance, and hospitality.

In many cases, growth opportunities are being led by smaller firms rather than established players, many growth opportunities are being enabled by changes in technology (digital disruption), and opportunities are likely to have rising skill requirements over time (hence the importance of tertiary education).

The Illawarra region's proximity to Sydney is also a defining feature – one which should be embraced for economic development purposes, not shunned.

The region's continued economic development can be supported by harnessing the 3Ps of population, participation and productivity – the building blocks of economic growth:

- Encourage **population** movement to the Illawarra region through affordable housing, lower costs for business and good infrastructure.
- Encourage **participation** in the labour force by improving skill levels, providing assistance for redeployment from declining sectors, and providing more opportunities for University alumni to remain in the region.
- Encourage **productivity** growth by harnessing the region's natural advantages via Port Kembla, niche manufacturing, tourism, and excellence in health care driven by the region's demographic profile.

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1 Recommendations

This section outlines recommendations and strategies that could be promoted by RDA Illawarra or the region's three local councils. Many of the recommendations suggest further analysis be undertaken in key areas of need.

The recommendations are based on research and areas of focus within the current project (undertaken by Deloitte Access Economics and commissioned by RDA Illawarra). They are focused on promoting economic development and welfare, and are necessarily at a rather broad level. They are not meant to cover off on all the areas that RDA Illawarra may seek to consider as it deems necessary.

While the recommendations are focussed on Illawarra specific issues, not all are solely for direct action by local government.

It is recognised that a lot of work has already been done in many of these areas, and collaboration between RDA Illawarra and relevant stakeholders can maximise the value of work already conducted. The current report is not meant to replace other research – it is intended to highlight areas of opportunity and challenges that the Illawarra region faces both now and into the future.

To be truly effective, a firm commitment from key stakeholders, including all levels of government and the private sector, is required in implementation.

Finally, the current report is the first stage of a three stage process in the Transition Illawarra initiative. Stage two will comprise the prioritisation of recommendations and a comprehensive implementation plan outlining responsibilities, timeframes and key actions.

General

1. **Establish an implementation plan by RDA Illawarra and the Transition Illawarra Stakeholder Group** that highlights responsibilities, timeframes and key actions in relation to the implementation and prioritisation of the recommendations presented below.

Transport links

2. **Continue to support the relevant government agencies in ensuring cost benefit analysis is undertaken on major transport infrastructure projects within the region.** Projects include:
    - the construction of the Maldon to Dombarton rail link;
    - improvements to commuter rail travel time on both the Illawarra (suburban) line and the South Coast (intercity) line;
    - the construction of the Albion Park Bypass from Yallah to Oak Flats;
    - improvements to a number of interchanges with the M1 motorway and internal transport links within the Illawarra;

- the extension of the F6 (now M1) motorway north to Sydney from Waterfall to Alexandria; and
- the duplication of Picton Road.

Prioritisation should be based on the highest benefit-cost ratio (BCR). Only some of the projects above have been the subject of cost benefit analysis – notably the duplication of Picton Road (Meyrick 2008), the extension of the F6 (ACG 2002), and the Maldon to Dombarton rail freight link (ACIL Tasman 2011).

3. **Continue to work with key agencies in improving rail travel times throughout the Illawarra region** and explore potential options to achieve a 60 minute travel time from Wollongong to the Sydney CBD as recommended in the State Infrastructure Strategy (Infrastructure NSW 2012). Also play a role in encouraging the development of residential and commercial centres at major railway stations and exploring the potential for value capture options to assist in funding improvements to travel times.

4. **Play an active role in working with local councils and other key stakeholders to support these infrastructure projects** and work with Infrastructure New South Wales to ensure there is a clear delivery timeframe for the projects.

5. **Investigate alternative funding sources to reduce the need for government funding** of key infrastructure projects, in particular the potential for private funding (e.g. though Australian/international pension/superannuation funds) of rail freight upgrades such as Maldon to Dombarton (while recognising that a lot of these discussions will occur on a commercial in confidence basis and that some funding for these projects will need to be provided by local, State and Federal governments).

Health and ageing

6. **Support initiatives such as the creation of a Centre for Excellence in Aged Care** and work with the University of Wollongong to support initiatives to enhance aged care provision and research. This will assist in promoting the region as a retirement destination, supporting businesses that operate in the sector (both existing and potential), and transforming the region into a nationally recognised 'base' for the provision of excellence in aged care services more broadly.

7. **Review existing assessments of the region's health and aged care needs both now and into the future**.
   - In relation to health care, consideration should be made of the extent to which the region's current health services are sufficient to support an ageing population. RDA Illawarra and local councils should work with the Illawarra-Shoalhaven Health District to ensure that the delivery of new medical facilities is co-ordinated with opportunities to accommodate additional aged care places in the region.
   - In relation to aged care, analysis should be conducted into the extent to which elderly citizens' care needs are being met. This will give an indication of whether certain types of care (for example, residential versus community care) are needed more urgently than others. Using this information RDA Illawarra should work with State and Federal authorities to ensure any areas of unmet need are addressed as a priority.

8. **Undertake an audit of the region's aged care workforce needs now and into the future.** In addition to assessing workforce needs, the audit should consider the barriers that might exist in attracting workers to the aged care sector (as well as strategies for addressing those barriers), and a comparison with other sectors' abilities to attract and retain appropriately qualified staff.

9. **Work with local councils and the NSW Department of Planning & Infrastructure** to ensure that an integrated approach is taken to strategic and land use planning to ensure sufficient land is allocated for health and aged care needs now and in the future.

10. **Support the development of more research, courses and curriculum at the University of Wollongong (including the IHMRI), TAFE Illawarra, Healthy Cities Illawarra, the Illawarra-Shoalhaven Medicare Local, and other training providers to place greater focus on the provision of education in health care and related disciplines** to help support the region's ageing demographic, and to ultimately expand the availability of 'home grown' health and aged care professionals.

11. **Identify entrepreneurial opportunities associated with the health and aged care sector,** and support local businesses seeking to harness the business opportunities that might flow from an ageing population

Business development

12. **Work with key agencies and current initiatives (such as Advantage Wollongong) to actively market the region both to prospective businesses and residents**. The Illawarra's proximity to Sydney presents a considerable opportunity to diversify the economy. Over the longer term, the more Sydney based workers that decide to live in the region, the more attractive and feasible it will become for businesses to open offices in the region.

13. **Coordinate a telework campaign for the Illawarra region** that encourages teleworking, and recognises the benefits of teleworking, both to individual firms and employees, as well as the broader economy. A similar recommendation was made in the Illawarra Digital Strategy (Explor Consulting 2013), and could include:
    - making public submissions and participating in telework forums etc. to help 'brand' Illawarra as being a telework region; and
    - supporting current and proposed telework hubs in the region – whereby multiple businesses can be located in shared offices and investigate with State and Federal government departments the possibility of them being the anchor tenants for future facilities. For example, the Digital Strategy notes the possibility of residents in, say, Kiama or Shellharbour commuting to a 'telework centre' in Wollongong which would allow them to connect remotely to their job in Sydney, or alternatively commute to 'Smart Hubs' in Kiama where high speed broadband currently exists.

14. **Work with NSW Trade & Investment to create a more favourable environment for businesses to relocate to the Illawarra** or establish secondary or support facilities there. Further, local councils should continue to monitor the supply of different grades of industrial and commercial real estate within the region, and ensure the planning framework supports the expansion of professional services over time.

15. **Explore and prioritise ways to enhance the manufacturing sector's capacity to adapt to changing economic times, and provide support for relevant organisations to work together more effectively**. For example, collaboration between facilities such as the UOW's Innovation Campus or SMART Infrastructure Facility, AIIM, AiGroup, i3net, Clean Tech Illawarra, and manufacturing employers might facilitate a switch in focus toward 'advanced manufactures' or manufacturing services.

16. **Work with landholders and relevant stakeholders to identify strategic land use opportunities to meet business demands**. This may include both public and private land.

17. **Maximise the opportunities available at the UOW Innovation Campus,** with a particular focus on encouraging further related IT and professional services employment. For example, despite the UOW being the State's largest provider of IT graduates, IT accounted for only 1% of the region's workforce at the 2011 Census.

18. **Work with key stakeholders to further develop and promote the region's IT sector**. This should include support and promotion of existing assets (e.g. new data centre), investigating the potential for future investment in IT related assets, and facilitating collaboration between the UOW's IT faculty and the region's nascent IT workforce.

19. **Undertake an audit of existing business support and entrepreneurial programs available to SMEs** as a means of nurturing that sector and providing them with a better understanding of what is available in the region, for example, the Wollongong Small Business Club. The audit should include a review of business engagement levels and challenges to determine whether any changes need to be made, and the results of the audit should be made publicly available and promoted appropriately.

Workforce development

20. **Encourage local training providers to focus on training needs identified in key demand areas**, noting an expected increase in demand for post-school qualifications, particularly in health care and social assistance.

21. **Work with key stakeholders and industry to develop more opportunities for long term disadvantaged employment seekers**. This should, as far as practicable, identify entry level positions in key growth sectors and highlight any preparatory needs of job seekers to take up those opportunities.

22. **Work with State and Federal agencies to ensure that adequate resources are available to assist where possible those affected by a changing economic environment,** and maximise the use of current programs to up-skill existing workers. This is especially given the long term shift towards a more service oriented workforce. Such assistance could involve, for example, the provision of interview training or assistance with job seeking for retrenched workers, or assistance in reskilling/upskilling existing workers to ensure they remain competitive in a changing labour market.

23. **Identify and collate case studies on successful approaches to help older workers (45+) to remain in and, if necessary, re-enter the workforce following retrenchment.** The latter recognises in particular the increasing difficulty that older workers face, particularly in regional areas, when re-entering the workforce following a job loss.

24. **Work with key stakeholders to further build on the region's strengths in the education sector** to find opportunities to export education and to attract overseas students to the region. Particular opportunities may be found in government programs.

25. **Work with local councils and the NSW Government to highlight the opportunities available through a greater and more consistent approach to social procurement.** While considerable effort has gone into developing guides and parameters around social procurement, practical implementation has been slower than anticipated.

Housing

26. **Work with local Councils and the NSW Department of Planning and Infrastructure to ensure the region is able to accommodate future housing needs**. While sufficient land exists in new housing release areas to meet likely greenfield demand over the next 20 years, it will also be important to ensure that adequate leading infrastructure is provided to support the development of these sites as well as infill areas. This will ensure adequate release of land for residential housing so that the region can continue to provide affordable housing for first home buyers.

Tourism

27. **Work with local councils and key tourism organisations to look at opportunities to explore barriers to Asian tourism in the region.** Despite its proximity to Sydney Airport, the Illawarra region has remained largely unaffected by the huge growth in tourism from developing Asia, with the majority of its international visitors coming from 'traditional' sources such as the UK, the United States or New Zealand.

28. **Undertake a detailed assessment of the tourism assets required to further support the development of tourism within the region,** including expanded tourism facilities near the region's beaches.

29. **Work with key stakeholders to ensure local organisations have the opportunity to leverage off one another for events occurring in the region**. For example, conferences held at UOW provide an excellent opportunity to promote the region as a destination for recreational, academic and business related tourism.

2 Economic and strategy review

This chapter provides a brief overview of the Illawarra region, and then summarises the key findings of the data review and the review of existing research and literature for the Illawarra region. Further details on all of these aspects are provided in Appendix A to Appendix E.

2.1 Overview of the region

Snapshot of the Illawarra economy (2011 Census)

- **Population**

  Total population: 276,006 persons
  Share of NSW population: 4%
  Working age population (15-64 years): 178,596 persons
  Aged dependency ratio: 25%
  NSW aged dependency ratio: 22%

- **Labour force**

  Labour force: 128,045 persons
  Employment: 119,454 persons
  Unemployment rate: 6.7%
  Participation rate: 60%

- **Employment composition**

  Industry share of Illawarra employment
  Agriculture and mining: 3%
  Manufacturing: 10%
  Construction: 6%
  Utilities: 1%
  Services: 48%

Source: Deloitte Access Economics, Australian Bureau of Statistics

RDA Illawarra defines the Illawarra region as consisting of three local government areas (LGAs): Kiama, Shellharbour and Wollongong. Unless otherwise noted, that is the definition adopted for the Illawarra region in this report.

In some cases, relevant data is only available on a broader regional coverage (sometimes where that includes the neighbouring LGAs of Shoalhaven and Wingecarribee). This represents the Australian Bureau of Statistics' Statistical Division for Illawarra. For this report, in cases where data presented relates to a broader region than the three LGAs of Kiama, Shellharbour and Wollongong, that is noted with the relevant data.

Figure 2.1: Local Government Areas in the Illawarra region

Source: Illawarra Mercury

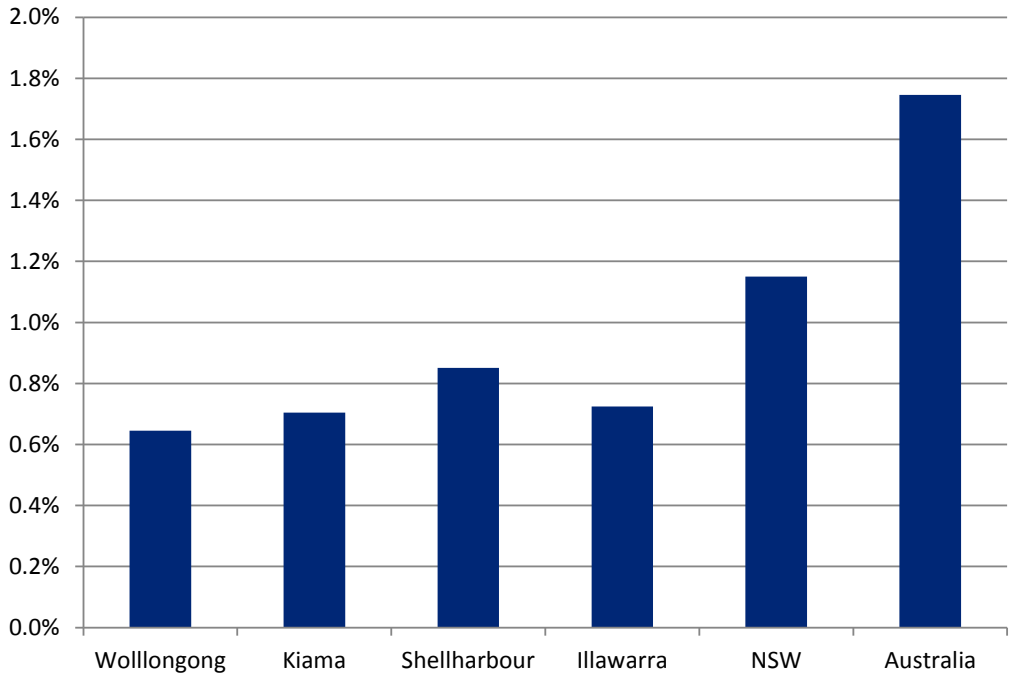
2.2 Data review of regional economy

2.2.1 Population structure and trends

At the 2011 Census the Illawarra region had a total population of 276,006 persons, or some 4% of the total New South Wales population. The Illawarra region recorded average annual population growth over the five years to 2011-12 of 0.6%. That compares to growth of almost 1.2% in New South Wales and almost 1.8% in Australia.

Though all areas within the Illawarra recorded population growth below the State average, the fastest growing area was Shellharbour, with average annual growth of 0.9%, followed by Kiama (0.7%) and Wollongong (0.6%).

Chart 2.1: Population growth by region, 2006-07 to 2011-12

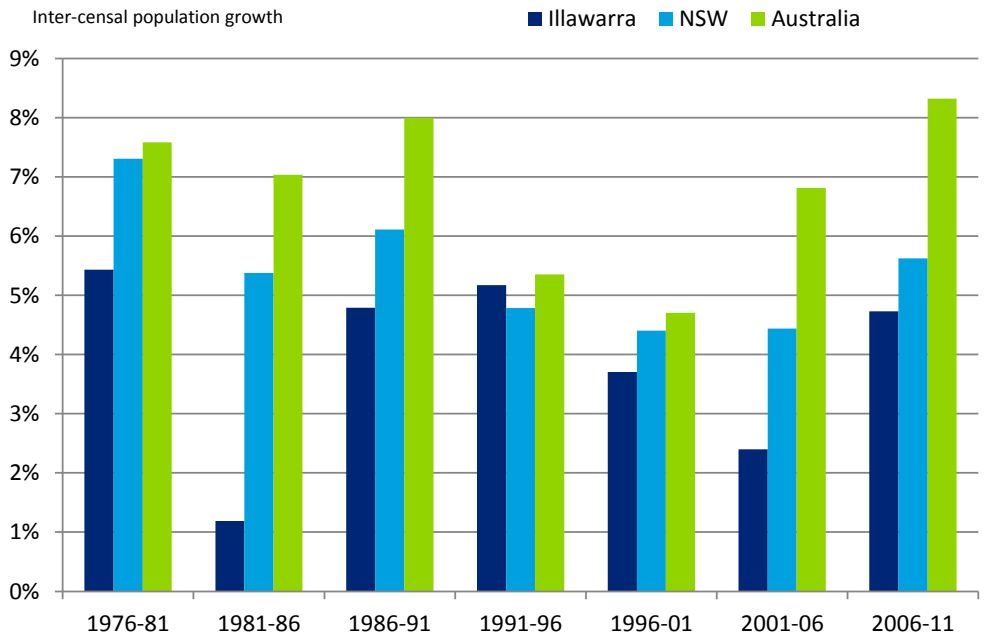


Source: ABS 3218

Chart 2.2 compares population growth from 1976 to 2011 in the Illawarra region with the totals for New South Wales and Australia. The chart shows that the Illawarra's relatively slow population growth has been consistent over a long period. In part this reflects the significant structural change the region has experienced over an extended period. Indeed, large scale manufacturing layoffs around Port Kembla happened as early as 1983, which likely explains the very low growth rate recorded between 1981 and 1986.

Population growth picked up slightly in the most recent inter-Censal period to almost 5% over the five year period but remains well below both the State and national averages.

Chart 2.2: Population growth through time, Illawarra, NSW and Australia

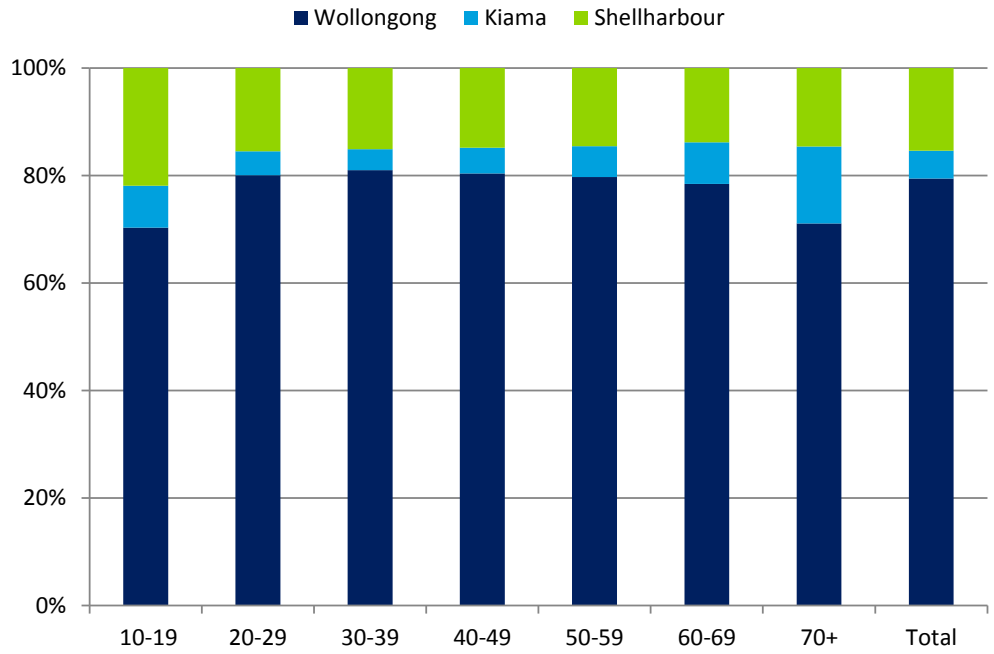


Source: Census data, 1976-2011
Note: Pre-1996 data are by place of enumeration; 1996-2011 are by place of usual residence

2.2.2 Workforce structure and trends

Within the Illawarra region Wollongong has the majority of workers in all age cohorts, though its dominance tends to be concentrated around the prime working ages, with the younger and older workforces relatively more evenly distributed across the three LGAs. This may reflect an abundance of manufacturing and services jobs in Wollongong relative to Kiama and Shellharbour.

Chart 2.3: Location of workforce by age group



Source: 2011 Census

The Illawarra's unemployment rate has been higher than the State average since the late 1980s (from when consistent data are available), and its labour force participation has been consistently lower.

As will be discussed in this report, a key opportunity for the Illawarra region lies in its proximity to Sydney, and the extent to which Sydney workers might opt to reside in the Illawarra and commute to Sydney each day for work.

'Journey to work' is a key facet of the Illawarra's workforce – a full discussion is contained in Appendix B. To summarise, some 94% of individuals who work in the Illawarra also reside in the region, but only 72% of Illawarra residents who are employed actually work in the region. In other words, more than one quarter of employed people who reside in the Illawarra travel outside the region for work.

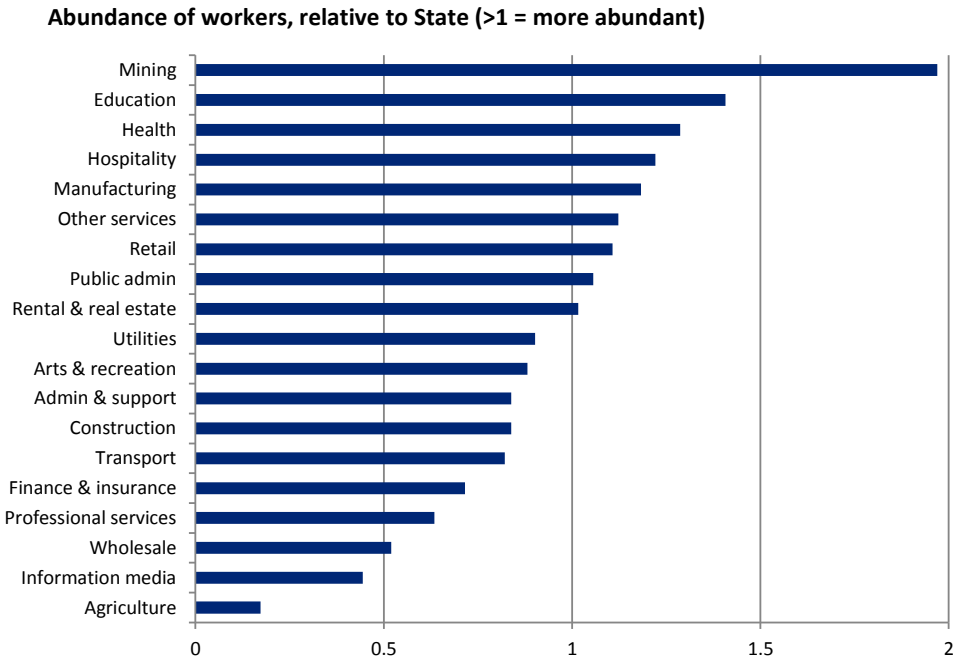
2.2.3 Industry structure

In brief, the Illawarra's workforce is comprised of a relatively high share of 'blue collar' occupations such as labourers and technicians, and a lower share of highly skilled occupations such as professionals and managers.

As with most regions throughout Australia, the last twenty years have seen a gradual shift of the Illawarra's workforce away from traditional, 'blue collar' industries such as manufacturing and toward higher skill industries such as services. That said, the Illawarra region remains relatively well represented in regards to traditional industries, and relatively under-represented in regards to service-based industries.

The industry with the greatest degree of over-representation in the Illawarra relative to NSW is mining. This is followed by education, given the notable role of the University of Wollongong, and health care, given the region's relatively older demographic. IT services, professional services and finance and insurance all have representation well below the State average.

Chart 2.4: Industry intensity, Illawarra relative to NSW



Source: 2011 Census

2.2.4 The housing market

The slow population growth and workforce growth referred to earlier have also kept Illawarra housing values relatively low compared to other regions (see Chart C.13 in Appendix C). Deloitte Access Economics' analysis indicates that housing affordability in the Illawarra region has traditionally been relatively better than many other regions of NSW, particularly parts of Sydney.

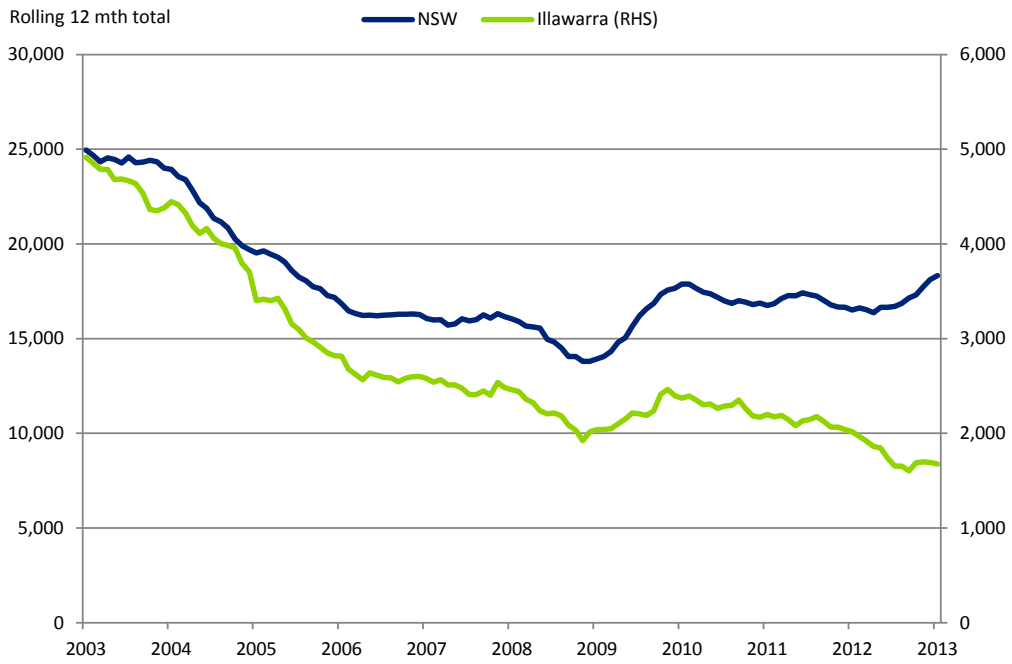
That said, it is important to note that this analysis considers the median house price, not the average. Many stakeholders have expressed concern at Wollongong's high house prices. Indeed, recent sales figures indicate that housing values in certain areas – particularly coastal suburbs of northern Wollongong such as Austinmer and Coledale, as well as coastal suburbs of Shellharbour such as Barrack Point, are considerably higher than 'Sydney prices'.

Overall however, and as shown in Chart 2.5, the Illawarra region's relatively slow population growth has contributed to a decline in building activity, as measured by private sector dwelling approvals. Driven by slower economic and population growth relative to other States, housing approvals in New South Wales fell steadily between 2003 and 2008. The Illawarra region broadly followed suit, though with a faster pace of decline.

One reason for the Illawarra housing market's quicker downturn than the State's is that the region's population growth has lagged behind the State average. Moreover, house price growth in the Illawarra has been lacklustre, providing less incentive for new home construction in the region.

While both NSW and the Illawarra experienced a fiscal stimulus-driven lift in dwelling approvals in the immediate aftermath of the 2008 global economic downturn, the two series shown in Chart 2.5 have since diverged. While the State total has slowly begun to regain lost ground, approvals in the Illawarra have once again turned down.

Chart 2.5: Private sector dwelling approvals, NSW and Illawarra



Source: ABS 8731.0

Note: The definition of the Illawarra region used in this particular data series prior to 2012 included Wingecarribee. For consistency, Wingecarribee has also been included in the post 2012 data.

2.3 Review of existing research, initiatives and strategies

The draft report provided to RDA Illawarra on the 10th of September also contained a comprehensive review of literature and other jurisdictions' experiences when it comes to regional development strategies – these sections are reproduced in Appendix D and Appendix E.

Regional development strategies have evolved with our changing economy and society. Successful regional development takes a variety of forms, as illustrated by the differing paths of the Gold Coast, Gladstone and Newcastle economies.

The Illawarra's regional plans from RDA Illawarra and NSW Government agencies focus on economic development, infrastructure, communities and the environment. Over time, there has been a shift in emphasis away from business attraction towards a greater focus on attracting people and skills to regions.

A number of major regional development strategies currently exist for the Illawarra, including the:

- Regional Action Plan for the Illawarra, from the NSW Department of Premier and Cabinet;
- RDA Illawarra Regional Plan 2010-2015; and the
- Illawarra Regional Strategy, from the Department of Planning and Infrastructure.

In general, the priorities identified in each of these regional plans can be can be classified into four main themes:

- economic development;
- infrastructure improvements;
- community development; and,
- environmental sustainability.

In many ways these components are inter-related. Economic development results in increased demand for infrastructure, which in turn enhances accessibility promoting community development. As a community develops and grows, pressure is placed on the natural environment resulting in heightened concern about environmental issues. This environmental awareness can in turn impact the way and areas in which economic development occurs over time. In summary, it is important to recognise that while some aspects of regional development can produce virtuous cycles, some goals such as improving the environment and economy, or achieving development and community amenity can be in conflict, especially in the short term.

Common themes in regional development strategies include focusing on strengths, providing infrastructure, access to land, and services to attract businesses and people, encouraging innovation through clusters and collaboration with universities, and having a coordinated approach to policy.

Digital economy trends including telework, e-commerce, e-service delivery and changing industry and employment patterns will feature more strongly in regional development plans in coming years. Factors such as distance, natural amenity and natural resources remain important considerations in regional development.

3 Competitive analysis

Expectations of the future path for the Illawarra's economy cannot be formed in isolation from the broader economy. This chapter highlights a number of key broader factors which will have an influence over the path for the Illawarra region over time. Major trends examined in this chapter are:

- the rise of Asia;
- an ageing population;
- technological change
- business/industrial development; and
- implications from future growth in Sydney.

3.1 The rise of Asia

3.1.1 Overview

Australia's economic growth prospects going forward will be heavily influenced by both the extent and composition of global economic growth.

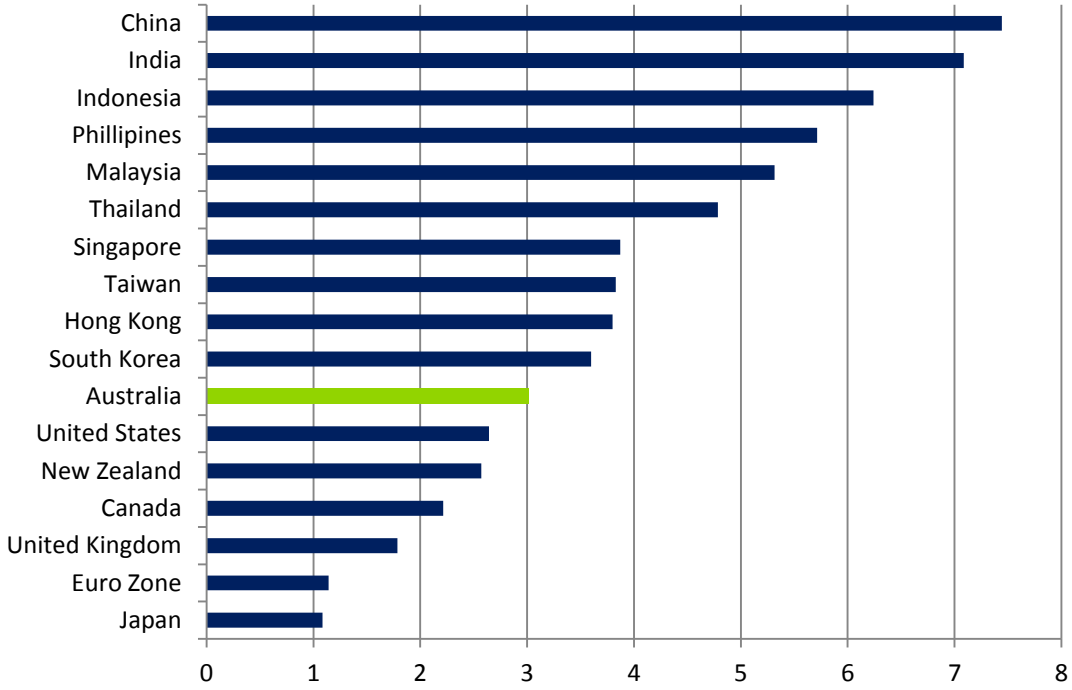
While growth rates may not be achieved evenly over time, it is expected that global economic growth over the next decade will be dominated by China and India, with other emerging Asian markets such as Indonesia, the Philippines and Malaysia also making strong contributions.

The Federal Government has highlighted these prospects in discussion of the 'Asian Century':

> Within only a few years, Asia will not only be the world's largest producer of goods and services, it will also be the world's largest consumer of them. It is already the most populous region in the world. In the future, it will also be home to the majority of the world's middle class.
>
> The Asian century is an Australian opportunity. As the global centre of gravity shifts to our region, the tyranny of distance is being replaced by the prospects of proximity. Australia is located in the right place at the right time—in the Asian region in the Asian century. (Australian Government 2012).

That means that the emerging economy growth that lifted demand for Australian coal and iron ore over the past decade will continue – China still has some way to go in its urbanisation and industrialisation, and the likes of India and others are following. The Illawarra region has played a key role to Australia's ability to take full advantage of these countries' voracious appetites for raw materials to feed their ever expanding cities.

Chart 3.1: Average annual GDP growth, 2013-2023



Source: Consensus Economics

But whereas the past decade has seen Asian economies grow primarily through urbanisation, investment and exports, the coming decades will require them to shift their focus toward services and domestic consumption. In other words, Asia's growth profile is changing, and through it so too are Australia's opportunities.

As Asia becomes more prosperous, its burgeoning middle class will want better housing, higher quality food, a sound education, more holidays and a better environment. Those new opportunities cover a range of sectors.

The Illawarra region is well positioned to meet these new demands. Port Kembla for example is the State's largest grain exporter and the third largest in Australia, and is well positioned to take advantage of a rising demand for grain. The University of Wollongong is already a major provider of international education, with approximately 40% of its student base being international students.[2] And finally, the region's natural amenity combined with its close proximity to Sydney mean huge opportunities to tap into the growing Asian tourist market (see section 3.5).

That said, important challenges exist. Despite the potential for an expansion of other forms of trade, coal remains the key player, and the outlook for coal demand is clouded with uncertainty. In this regard the Illawarra region also faces intense competition from other ports, with the vast majority of current coal investment being undertaken in Queensland

[2] This figure represents total enrolments. The UOW has campuses throughout the South Coast region, two in Sydney, as well as one in Dubai. The available data do not show enrolments by campus.

and the Hunter coal fields. Also, uncertainty exists over the sustainability of China's growth in coming decades.

3.1.2 Port Kembla

The presence of Port Kembla provides the Illawarra region with a direct connection to the growth of emerging Asia, which naturally provides many opportunities through merchandise trade. The Port's two biggest exports are coal (accounting for 70% of total export tonnage in 2011-12) and grain (14% of 2011-12 tonnage).

Strong demand for **coal** in China and other emerging Asian economies saw the price of coal increase sharply over the last decade, including a rise of 450% between late 2002 and late 2008 before prices retreated of late. While current coal prices still remain well above historic averages, there is some uncertainty surrounding the coal price outlook going forward, with increasing coal supply coming on board across Australia and globally.

The latest forecasts from the Bureau of Resources and Energy Economics (BREE) have metallurgical coal exports growing at an average rate of 5% a year between 2013 and 2018. Given lower projected prices in the short term much of the projected increase in exports comes from investment projects already underway.

The vast majority of major coal mining projects both underway and in the pipeline are outside of the Illawarra region. BREE's major projects database lists only two coal mining projects in the Illawarra, with a combined capacity of 5 million tonnes per annum by 2016, equivalent to around a third of Port Kembla's total coal export (not including the Gujarat NRE mine expansion, which has recently become increasingly uncertain). This should provide some support to coal exports in the short term.

Port Kembla is not as dependent on coal exports as the Port of Newcastle – coal accounts for 70% of Port Kembla's exports, and about 95% of Newcastle's. However, even at 70% coal is currently a dominant element for Port Kembla. With the longer term outlook for coal prices less certain, a diversification of the Port's export base will be important for its longer term future.

Grain exports represent one avenue of potential diversification, and should equally benefit from continued economic growth and development in emerging Asian economies over the decades ahead. Despite being highly susceptible to weather conditions and the size of the crop (adverse seasonal conditions resulted in zero grain exports from Port Kembla in 2007-08), grain exports have grown strongly in recent years, and in 2011-12 reached almost 3 million tonnes, the highest level since 2000-01.

In addition to population growth in developing countries there are other relevant factors pointing to an increase in grain exports from Australia, including a lack of groundwater for irrigation and other environmental pressures in China, which may continue to suppress the supply of agricultural commodities in that country; as well as likely changes in diet as the burgeoning middle classes of Asia demand more 'sophisticated', protein rich diets (to which grain will be a key contributor).

Imports to Port Kembla are dominated by steel raw materials, which in line with the region's manufacturing sector in general have been in decline over a number of years.

One important opportunity for growth lies with automobile imports. Since 2008, when motor vehicle imports to the Glebe Island port facilities in Sydney ceased, Port Kembla has become the NSW Government's preferred 'gateway' for motor vehicle imports to NSW. With imported cars carving out an ever increasing share of car sales in Australia (given continued pressure on domestic production of motor vehicles), there is potential for further import growth at Port Kembla from this source.

Further, Port Botany is close to capacity in containerised trade, and when this happens any excess demand is likely to be handled through Port Kembla. Currently Port Kembla handles less than 1% of the State's containerised trade, meaning any large scale relocation of excess containerised trade from Port Botany might also bring with it a range of infrastructure requirements (such as expanding the Port's existing container terminal), all of which has the potential to directly stimulate employment in the region as well as to assist with the gradual diversification of the Illawarra's economy.

Finally, the proposed Maldon to Dombarton rail link may provide a boost to both coal and grain exports through the Port, while the reclamation works currently underway at the Port's outer harbour and due for completion in 2015, should make it easier for large cargo ships to berth and unload at the Port. This project, along with other transport infrastructure, is discussed further in chapter 5.

3.1.3 International education

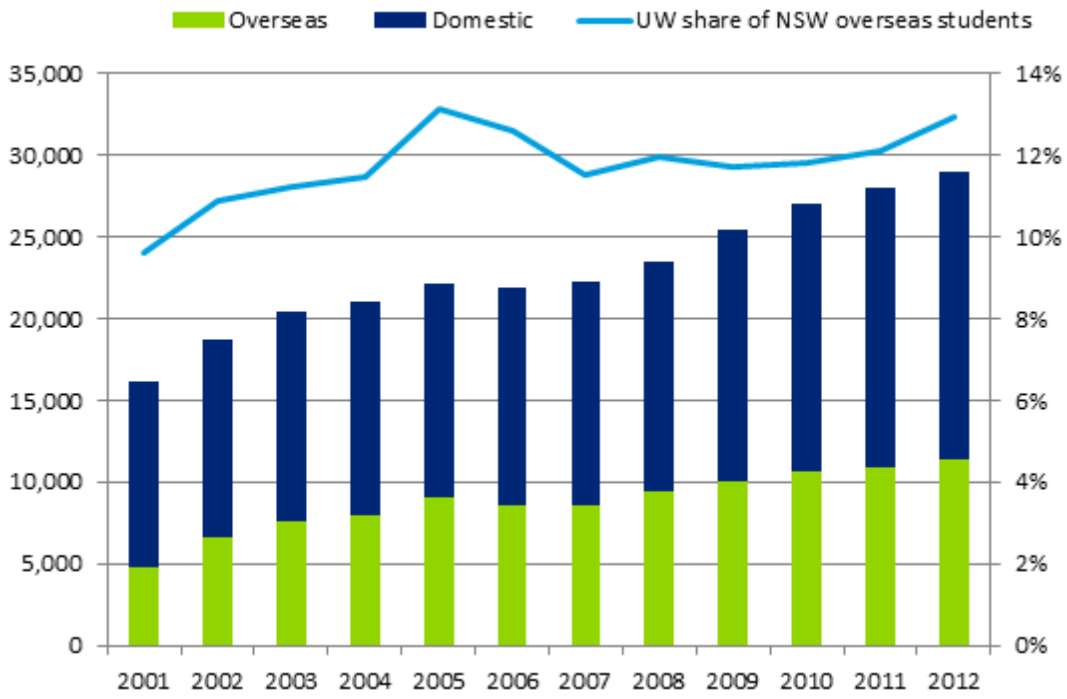
International students make up around 40% of the University of Wollongong's (UOW) student base, providing an important trade linkage and one which offers some further potential to grow[3].

International education has been an important growth sector for the Australian economy since 2001. Since that time international student enrolments at the UOW have grown at an average rate of 9% a year, exceeding the average rate of growth seen nationally and in New South Wales.

Although domestic student enrolments at UOW have grown strongly over the past decade, the strongest growth has been from international enrolments. The UOW now accounts for 13% of NSW's overseas enrolments, compared to 7% of total enrolments.

[3] This figure represents total enrolments. The UOW has campuses throughout the South Coast region, two in Sydney, as well as one in Dubai. The available data do not show enrolments by campus.

Chart 3.2: University of Wollongong student enrolments, 2001 - 2012



Source: Department of Education

Higher skill levels will be important in sustaining economic growth within key Asian markets, which will further increase their appetite for higher education going forward. And as this market grows, the potential for further falls in the $A will also bring down the cost of studying in Australia compared to other countries.

But while the overall outlook may be positive, the future of education exports is not guaranteed, in part because delivery models are changing. Despite a growing demand for higher education, the delivery of educational content, particularly from universities, is being disrupted through the growth of Massive Open Online Courses (MOOCs). The rapid adoption of MOOCs suggests that students may disengage with courses that are perceived to have little value or fail to be flexible to meet their learning needs.

The Illawarra region (and Australia in general), benefited enormously through the 2000s from international education, not just from the value of the tertiary education delivered, but also because we brought international students here (rather than educated them in their home country), meaning the region (and Australia) also got the benefit from their associated spending.

But the growing market for MOOCs will place greater competition on the 'traditional' delivery models of education services to foreign students. Also, as foreign markets have grown in sophistication, so too have their own education systems, either through domestic institutions or through foreign institutions setting up campuses in these countries – the University of Wollongong has a campus in Dubai, for example.

3.1.4 China's growth prospects

Strong rates of economic growth from China and elsewhere in Asia are likely to be seen over the next decade.

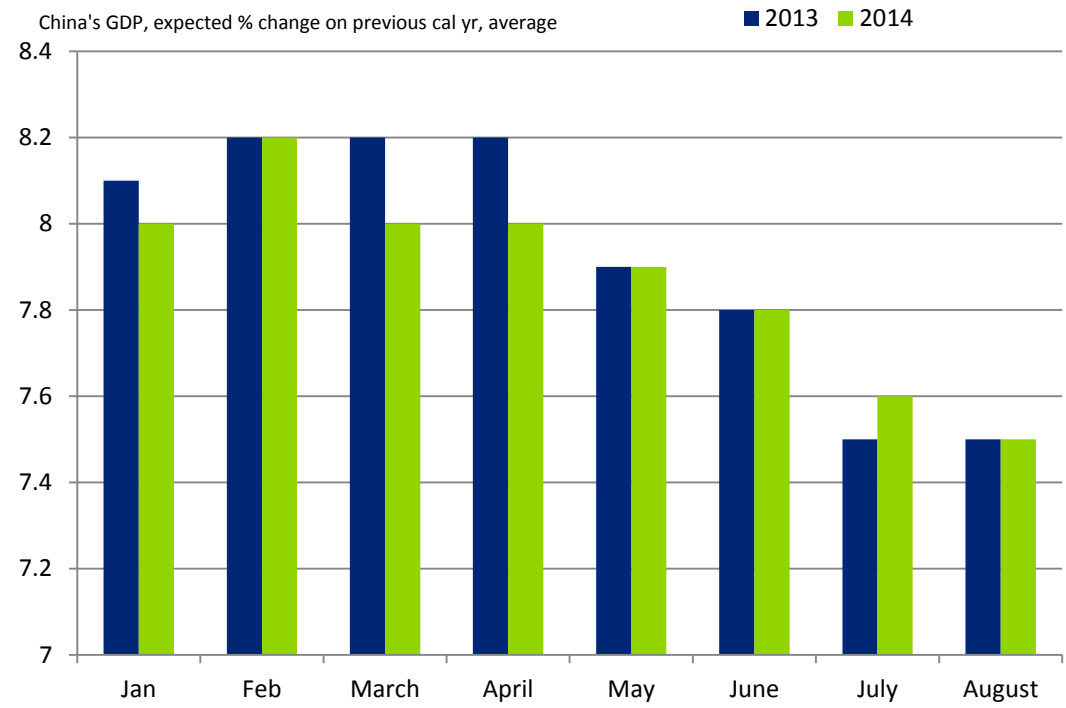
However, against that backdrop it is also possible that China's growth may stutter badly for a period of time, creating some significant short term challenges for trading partners if this occurs.

China's impressive economic growth over the past decade has been driven by a very high rate of investment in infrastructure and industrial capacity. This has been supported by both a large pool of 'surplus labour' (people moving in large numbers from rural to urban areas which has helped to keep wages low), and a frenetic rate of credit growth. But there are now concerns over both of these key drivers.

First, the rate at which China's rural poor are moving to urban areas may now be diminishing, which is helping to push wage growth up to a faster pace. Second, credit has also been far too cheap for far too long – while the authorities have taken some steps to amend this, China's current growth in credit is still unsustainable. Less labour supply, a pull-back in credit and diminishing returns to industrial expansion will mean less investment growth, and China's economy will need to rebalance towards consumer spending at a rapid rate.

Economists' expectations for China's near-term GDP growth have generally been declining since the beginning of the year. Expectations for 2013 growth were 8.1% at the start of 2013, but have now fallen to 7.5%, with a similar story for 2014 economic growth (Chart 3.3).

Chart 3.3: Consensus forecasts for Chinese GDP growth



Source: Consensus Economics

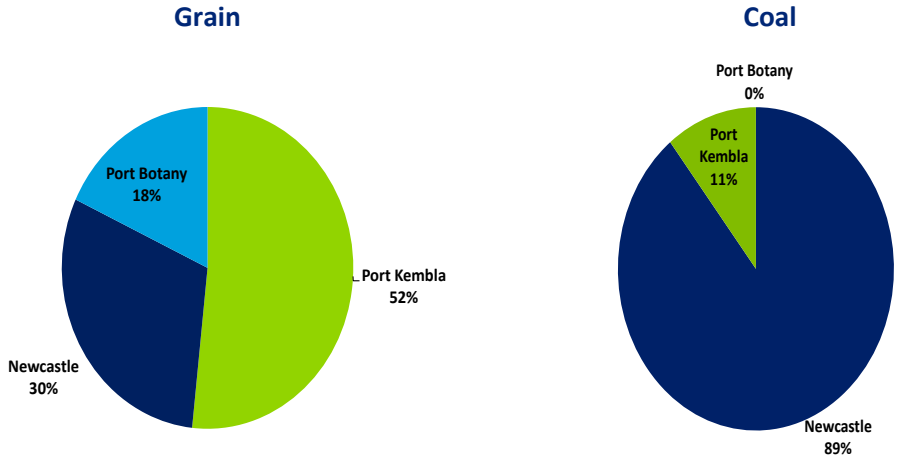
It is well understood that China's economic model needs to change, from one driven by investment and exports to one driven by domestic consumption. Inevitably this will generate a slower yet more sustainable growth rate for the coming decades. The key uncertainty however is whether it will be a hard landing – a sudden and catastrophic collapse in the country's growth rate – or a soft landing – a more gradual transition to a consumption driven society.

While a relatively smooth transition may occur, a notable reduction in China's rate of economic growth for one year or two years would have the potential to materially affect both of the key opportunities noted above - international education exports as well as future trade flows out of Port Kembla.

3.1.5 Competition from other ports

The bulk of New South Wales' coal exports go through the Port of Newcastle, servicing the extensive Hunter Valley coal mining region. Port Kembla services the coal mines in the Illawarra region, and often those in the western (near Lithgow) and southern (near Sydney) coal fields.

Chart 3.4: NSW Coal and grain exports, 2011-12 (by volume)



Source: Ports Australia

Looking forward, Port Kembla may face difficulties in maintaining its share of total coal exports. There is currently some $30 billion worth of committed coal mining investment in the works, with combined production capacity of some 144 million tonnes per annum (Mtpa), which is equal to nearly half of Australia's current coal exports. A further $40 billion worth of investment, with a potential capacity of some 200 Mtpa, is in the planning pipeline.

Although approximately 5 Mtpa of additional coal exports are likely to flow through Port Kembla in coming years, the vast majority of future coal investment is in the Queensland coal fields, with the majority of NSW projects occurring in the Hunter region.

So Port Kembla currently does, and will continue to face, stiff competition from other ports, particularly given the $900 million being spent at Newcastle to upgrade that port's coal unloading facilities.

As noted above, Port Kembla is not as dependent on coal exports as the Port of Newcastle, though it is by no means immune if coal capacity expansion and/or slowing global demand were to produce further notable falls in coal prices. If that happens, the Illawarra's mining operations could find themselves struggling to compete with more efficient, larger scale coal mines being developed in the Hunter and Queensland regions, which would be bad news for coal volumes through Port Kembla.

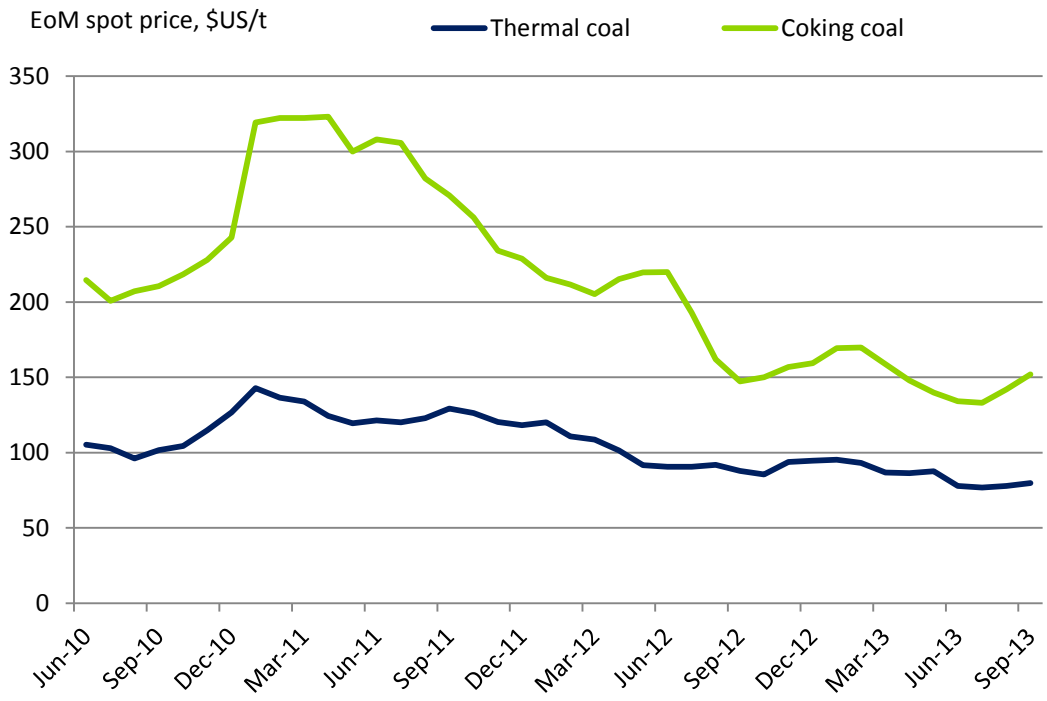
3.1.6 Price pressures for coal

Compared with the post-GFC peak of around US$330 per tonne in March 2011, the spot price of coking coal, the Illawarra region's major export, is currently trading around US$150/t. Though they are likely to remain elevated compared to 'pre-mining boom' levels, the price of Australia's major commodities is clearly trending gradually down, and will almost certainly never again reach the post GFC highs of March 2011.

Grace (2013) notes that Illawarra coal mines can easily become un-economical given a sustained fall in coal prices, suggesting that the challenge of competition from other coal fields in the Hunter Valley or Queensland regions may be all the more pressing.

The Bureau of Resources and Energy Economics, the Federal Government's official commodity forecaster, expects coking coal exports to increase by around 5% a year between 2012-13 and 2017-18 (BREE 2013). However, considerable uncertainty exists over the future of Australian coal exports, both because of uncertainty over the path for China's economic outlook and uncertainty over coal as an energy source.

Chart 3.5: Spot price of coal



Source: CBA, ANZ commodities briefs

3.2 Ageing population

3.2.1 Overview

Australia's population is ageing at a rapid rate. Some 17% of the Illawarra's current population is aged over 65, compared to 15% of NSW's current population. In twenty years' time these shares are projected to be 23% for the Illawarra and 20% for NSW.

In general, two key factors are behind the ageing demographic profile seen in Australia and across the developed world (as well as many developing countries like China). The first is an increase in life expectancy – the average man can now expect to live longer than his father, and the average women can expect to live longer than her mother.

In combination with increases in life expectancy, falling fertility rates, which have been common amongst the developed world over the past few decades, mean that elderly people make up a higher share of a given region's population. In this regard a region's dependency ratio - the ratio of population over 65 to working age population (15-64 years) – can say a lot about the future fiscal pressures that region is likely to face.

A higher dependency ratio means, among other things, that for every elderly citizen dependent on government support (such as pension payments and other social security entitlements), there will be fewer working citizens contributing to the pool of funds needed to meet those demands.

The Illawarra's dependency ratio is estimated to be 26%, rising to 39% over the next twenty years. NSW's dependency ratio is estimated to be 23%, rising to 32% over the next twenty years.

On average, people on retirement incomes generally have lower incomes than the working-age population, so a higher share of retirees means a lower average income for the Illawarra region looking forward. Those incomes may also be more dependent on factors occurring outside the region, such as decisions on the aged pension, and the performance of superannuation funds and other investments.

One potential positive for the region is that not all these additional retirees expected to live in the Illawarra will necessarily be home grown. The region's natural amenity and its proximity to Sydney provide it with a significant opportunity to attract retirees from Sydney, many of whom may come to the Illawarra with higher levels of wealth than is the average for the region (courtesy of Sydney's higher housing prices).

3.2.2 Health care

As the population grows older, it will demand a greater level and range of health services including hospital and other medical treatment, as well as aged care services such as meals on wheels, community services and residential care (which may be broadly termed 'health care').

At the 2011 Census health care accounted for 15% of the Illawarra's workforce, compared to 12% of the State and national workforces. Overall health care employment grew by a very strong 25% between the 2006 and 2011 Census, the fastest of all industries (except mining).

Health care employment can be divided into four sub-sectors (at a 2-digit ANZSIC level) of roughly equal proportions: hospitals, medical and health care, social assistance and residential care. For the Illawarra, the strongest growth in health care employment in recent years has been directly related to aged care, with residential care employment growing by 48% between the 2006 and 2011 Census, and social assistance by 33%. This compares with 11% growth in hospitals and 12% growth in medical and health care.

About 40% of the region's current health care workers are classified as professionals. A further 30% are community and personal service workers, 16% clerical and administrative workers, 5% managers and 5% technicians and trades workers.

An ageing population is already driving strong growth in the health care sector in the Illawarra, with additional growth expected over the next twenty years (discussed further in section 4.1). Though the residential care and social assistance sub-sectors will see the biggest rise in employment over the next twenty years, the benefits will be spread across all aspects of the health sector.

The Wollongong Hospital has quite a large population from which to draw patients, so an ageing population not just in the Illawarra but in the broader Southern Highlands area has the potential to generate additional employment in the Illawarra region.

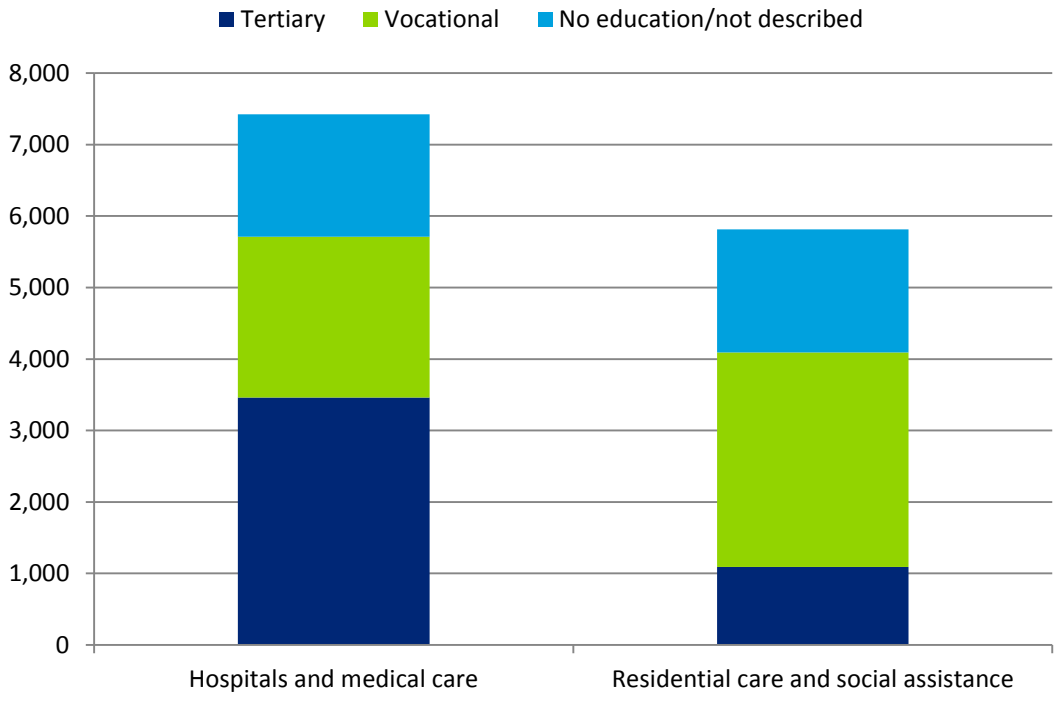
Growth in the health sector will generate potential for the region to attract doctors and nurses from other regions, especially Sydney. Almost 30% of health care workers in the region are employed directly by hospitals. Data from the 2011 Census show that about 4% of health care workers employed in the Illawarra reside in Sydney and its surrounds – not overly different from other sectors of employment.

With strong demand for these health care occupations going forward, unless the region is able to attract and house the doctors and nurses required to support an ageing population, its reliance on 'imported' health professionals will rise, and limit the extent to which an expansion in health care employment can benefit the broader regional economy.

3.2.3 Links to education

Perhaps unsurprisingly, the region's health care workforce is relatively more qualified than average – three quarters of the health care workforce has a degree or VET qualification (35% have a degree and 40% have a VET qualification), compared to 63% of the workforce overall (22% have a degree and 41% have a VET qualification). However, a clear distinction exists between the hospital and medical and other health care sectors on the one hand, and the residential care and social assistance sectors on the other. As shown in Chart 3.6, the former are far more likely to hold a tertiary qualification and the latter far more likely to hold a vocational qualification.

Chart 3.6: Qualifications of Illawarra health sector workers, 2011



Source: 2011 Census

With more and more of the future workforce likely to be employed in health care, it follows that education in the health care sector, both tertiary and vocational, represents a key opportunity for the region. For example, while the UOW does offer degrees in health related disciplines, health is not a major focus of the University – its major focus is on IT, engineering and commerce, which accounts for about 40% of total student enrolments. UOW accounts for 7.5% of the State's students, but only 6.5% of its health students.

However, overall enrolment in the health faculty has more than trebled in the past decade, with doctor level courses only offered since 2007.

It is likely that a majority of the doctors and nurses currently working in the Illawarra did not grow up in the region, nor study in the region. But with health care employment on a clear upward trend, the potential economic benefits of the region expanding its pool of 'home grown' health professionals are significant.

Every health care professional that remains in the region will generate demand for a range of other services –housing, utilities, personal services, as well as places to eat, shop and relax. Hence, positioning the education sector now to take advantage of an ageing population in coming years might ultimately assist in improving the long term growth prospects of the Illawarra region's economy.

The region's modest population growth expected over the next two decades (see section 4.1) raises the very real possibility of skill shortages in health care, and perhaps particularly for the residential care and social assistance sector. Whereas intern doctors and nurses are allocated according to need, no such system exists for vocational occupations. The region's vocational education providers will be key players in alleviating any such skills shortage.

3.2.4 Effects on other industries

As discussed above, an ageing population could stimulate growth in the **education** sector, through the provision of health related education services.

Other industries will also find opportunities. The **finance** sector, for example, might be able to position itself to better support the needs of retirees. As noted in Appendix C, employment in the region's finance sector has grown strongly over the past decade, primarily due to strong growth in the superannuation sector. An influx of wealthy Sydney retirees might further stimulate growth in the finance sector, both in the form of traditional banking services as well as specialist advisors such as financial advisors and superannuation specialists.

The **hospitality** sector could also benefit from an ageing population, particularly if the region attracts wealthy retirees from Sydney who frequent the region's shops, restaurants and cafes. **Arts and recreation** would also likely benefit for much the same reason.

The effect on the **construction** industry is less clear. Residential construction could benefit, particularly if wealthy Sydneysiders increasingly decide to retire in the region, or additional health care professionals move to the region in response to a growing health care sector.

3.2.5 Labour market effects

Other things equal, with the elderly share of the population set to rise in coming years (adding to demand for services but not adding to the labour force), the potential pool of workers from which to staff the region's industries will be more limited.

With the ratio of retirees to working age population rising, the result may be upward pressure on wages.

At the same time, faster growth in health care employment than in other sectors will change the 'face' of the labour market – from one with a high blue collar weighting towards one which is more focused on the delivery of services.

3.3 Technological change

3.3.1 Overview

Failure to adapt to the digital transformation sweeping the economy has the potential to leave businesses both without a customer base and with a higher cost structure. The second instalment of Deloitte's working paper series entitled *Building the Lucky Country* focused on digital disruption and the different impacts that it might have on different sectors.

The report considered disruption both by the speed with which it will occur (the 'length of the fuse), and by the impact that it will have on businesses' fundamental operations (the 'size of the bang'). This generates four different possible combinations:

- Short fuse, big bang
- Long fuse, bug bang
- Short fuse, small bang
- Long fuse, small bang.

Figure 3.1: Deloitte's digital disruption map

Source: Deloitte 2012

While the retail sector is generally front of mind in relation to digital trends, the truth is that most Australian workplaces are going to be affected in some form over the next few years. Several factors affect the extent to which industries are likely to be affected by digital disruption in the future – both the 'size of the bang' and the 'length of the fuse.'

For example, the physicality of the product is vital – despite a newfound ability to book hotel accommodation online, manual labour is still required to clean the room and make the bed. At the other end of the scale (and therefore more subject to digital disruption), people no longer need to wait for the latest episode of a TV show to be broadcast in Australia – or even to be watched on a TV.

The extent of competition and regulation is very important. In highly competitive sectors such as retail change can come fast, but in a heavily regulated sector such as electricity generation, the pace of change may be dampened by lengthy approval processes.

The extent to which new technologies can reduce entry barriers and allow small companies to compete with large existing businesses will also determine the 'size of the bang'. The proliferation of 'cloud' applications is a good example, as is the ability of employees to work more flexibly (and to telework).

With these examples in mind, it becomes clear that sectors with a 'short fuse and big bang' include retail, information media, finance, professional services and real estate. Heavily regulated sectors such as education, health, utilities and transport face large amounts of disruption, but the regulated nature of these sectors means change will come slower – i.e. they have a long fuse and a big bang.

At the other end of the scale, sectors with a strong degree of physicality, such as manufacturing and mining, are in the 'long fuse, small bang' category; while sectors such as hospitality, construction and wholesale trade are in the 'short fuse, small bang' category.

Many of the sectors most likely to drive the Illawarra's economy looking forward are also amongst the sectors most exposed to digital disruption – that is, professional services, health care, education and finance. Adapting to digital transformation is therefore especially important for the Illawarra's economic future.

3.3.2 A growing IT sector

The information media sector, also referred to as IT in this report, is one of the most under-represented industries in the Illawarra region – at the 2011 Census the region accounted for 3% of total NSW employment, yet only 0.5% of employment in information media. Despite this, the region's nascent IT sector is considered one of the key opportunities for the Illawarra's future economic development. To that end the RDAI has recently commissioned a comprehensive digital strategy (Explor Consulting 2013) to outline the opportunities and challenges for the IT sector in the region.

Much of the strategy is centred on the University of Wollongong. The UOW has the fourth largest IT student intake in Australia, beaten only by Monash University, RMIT, and the Queensland University of Technology. The UOW accounts for 18% of NSW's IT student body and 5% of Australia's, however the digital strategy notes that the majority of these students do not remain in the region upon completion of their studies.

So clearly there is potential for an expansion of the region's IT workforce. A key step forward in this regard is the UOW's Innovation Campus, which is arguably the most promising aspect of the region's otherwise stagnant office market (see section 3.5). The ultimate plan is for the Campus to provide total floorspace of 135,000 square metres, which is nearly the same size as the total space currently available in Wollongong's CBD. It is currently up to around 45,000 square metres (Wollongong City Council 2013).

The Campus has attracted some criticism in the media for high vacancy rates (Martin 2013). However this may reflect recent cyclical factors. Over the longer term, with an abundance of well qualified graduates from the UOW seemingly at its doorstep, the Campus may be a key way for the region to not only enhance its IT sector but also to diversify its economy more broadly (since many of the tenants currently in the Campus are not 'IT' tenants per se).

The extent to which the Illawarra region can expand its domestic IT sector will be limited by competition from other cities, in particular Sydney and Melbourne.

Sydney is already recognised as Australia's IT capital, and is home to the established Macquarie Park office tech precinct in Ryde, as well as the recently established SUPER (Surry Hills, Ultimo, Pyrmont, Eveleigh and the Rocks) Digital precinct on the edges of the CBD.

Macquarie Park, for example, has approximately 800,000 square metres of office space[4] and is already a well-established technical precinct, home to a number of major IT companies. And the SUPER Digital Precinct has a very similar goal to the Innovation Campus: namely, to be "a force of innovation and entrepreneurship, attracting our best and brightest, and generating a substantial new source of economic activity" (NSW Digital Economy Task Force 2012).

Both of these precincts are far bigger in scale than Wollongong's Innovation Campus, and undoubtedly are a significant drawcard for UOW IT students.

3.3.3 Teleworking

As discussed below in section 3.5, the 'journey to work' of many Illawarra residents to Sydney and surrounding regions should not necessarily be viewed as a 'leakage' from the region's employment base, but rather as an opportunity to increase the region's population of working age citizens and ultimately its economic growth. Because people spend most of their incomes near where they live not where they work, the benefits to the region of housing a sizeable share of Sydney based workers are likely to be considerable.

The latest available data from the ABS show that some 37.7% of Australian businesses used the internet to enable at least some of their staff to work from home. Unsurprisingly, the services sector is most likely to have such arrangements. So with the Illawarra's future employment growth likely to be dominated by the services sectors (see Chapter 4), and with technological change making such arrangements more and more feasible,it is clear that teleworking has the potential to significantly affect the Illawarra region's current business model.

The impacts of teleworking should be considered from an individual perspective, a business perspective, and a regional perspective.

From an **individual** perspective, teleworking (be it full time or part time) reduces both the direct travel cost of commuting to work (including fuel, public transport fares, parking fees, etc), as well as the opportunity cost of time spent travelling. Access Economics (2010) noted that teleworkers save an average of three hours and 37 minutes per week – time which could be spent at work, and thus increasing productivity, or for leisure, and thus potentially increasing workforce participation.

By expanding the pool of potential jobs for Illawarra residents, teleworking means that many talented locals no longer need to leave the region in order to find a job. As teleworking becomes more and more commonplace, people will have a greater capacity to find their 'ideal' job, which will ultimately lead to both productivity and workforce participation benefits.

From a **business** perspective, higher availability of teleworking means a firm is able to recruit the 'best employee' not just the 'best employee in the area'. In this regard, teleworking can reduce the 'brain drain' on the Illawarra region, by introducing local employers to a potential labour market far wider than just Illawarra residents. Although

[4] To put this in context, this is roughly equivalent to the combined office space of Canberra CBD (650,000 sqm) and Wollongong CBD (150,000 sqm).

this will potentially make it easier for local firms to hire 'non-locals', it will also mean the business's productivity and ultimately profitability will improve.

A further saving will be from businesses requiring less office space. A potential benefit to the Illawarra region lies in the fact that as offices no longer need to be in close proximity to all of their workers, the relatively cheaper office rents in both the Wollongong CBD and the Innovation Campus might provide an attractive alternative for Sydney businesses.

From a **regional** perspective, there will be less need for the Illawarra's most talented workers to leave the region for work – they will still be able to work for, say, a Sydney based consulting firm, but rather than travelling to Sydney five days a week, they might opt to only travel to Sydney, say, three days a week and spend the other two days at home, teleworking. That amounts to a significant potential benefit for the region's local retailers and service providers. Local businesses will also be more able to hire the best staff regardless of their location, ultimately improving their profitability.

Teleworking may encourage Sydney based workers to take up residence in the Illawarra, but it might equally encourage Illawarra based workers to take up employment in Sydney while still residing in the region, which would offset the regional economic benefits of the former.

The 'net' benefits of teleworking are those that create a 'new' benefit, not merely a reallocation of existing benefits. One such benefit is greater workforce participation – teleworking will improve the flexibility of working arrangements and should ultimately lead to more people being actively involved in the workforce. Another such benefit is improved productivity – as noted above, the time spent commuting is considerable.

The recently released *#Illawarra Digital* Strategy (Explor Consulting 2013) also recognises the potential benefits of teleworking and calls for the region to set a 'bold target to increase numbers of teleworkers in the region and partner with Government and industry to build infrastructure that would support that goal'.

3.3.4 Access to new markets

Compared with other developed countries Australia has been somewhat slow to embrace online shopping. In 2010-11 online sales accounted for around 4% of total Australian retail spending, compared to around 9% in Britain and 7.5% in the United States (The Economist 2013). This means the challenges (and opportunities) presented by online shopping have been slower to appear in Australia than in other countries.

Nevertheless, over the past eight years online retail sales have grown by an average of 22% a year, whereas overall retail sales have grown by an average of just 4% a year. Online retail's share of total retail sales has risen over the period from 1% to 4%.

Of course, one downside of online retail from the traditional retailer's point of view is greater competition. And from a regional retailer's point of view, that competition will come not just from online, but also from other regions.

But the reach of the internet and its ability to be used for targeting specific customers make it a unique and powerful platform for advertising, selling and delivering goods and services

well beyond traditional markets and geographies. In that sense, businesses in the Illawarra need no longer be confined by their location when choosing who to sell to. Part of the 'economic gardening' program discussed in section 3.4 aims to provide participants with coaching in utilising online marketing and social media to grow their businesses.

Internet sales mean that Illawarra businesses have access to a global marketplace. Now like never before Illawarra firms have the capacity to reach potential customers and clients not just locally but around the globe. For example, as noted in section 3.4, the region has built a competitive advantage not just in manufactured products but also in the provision of manufacturing services and know-how.

The digital transformation that has both already occurred and that will occur in coming years will greatly increase the extent to which these competitive advantages can be harnessed. Traditional retailers, while naturally being affected by increased competition, will also benefit from bigger markets. The Economist (2013) notes that physical retailers who expand their online presence can actually be cost competitive against internet only retailers, because strong demand growth has made the cost of online advertising soar.

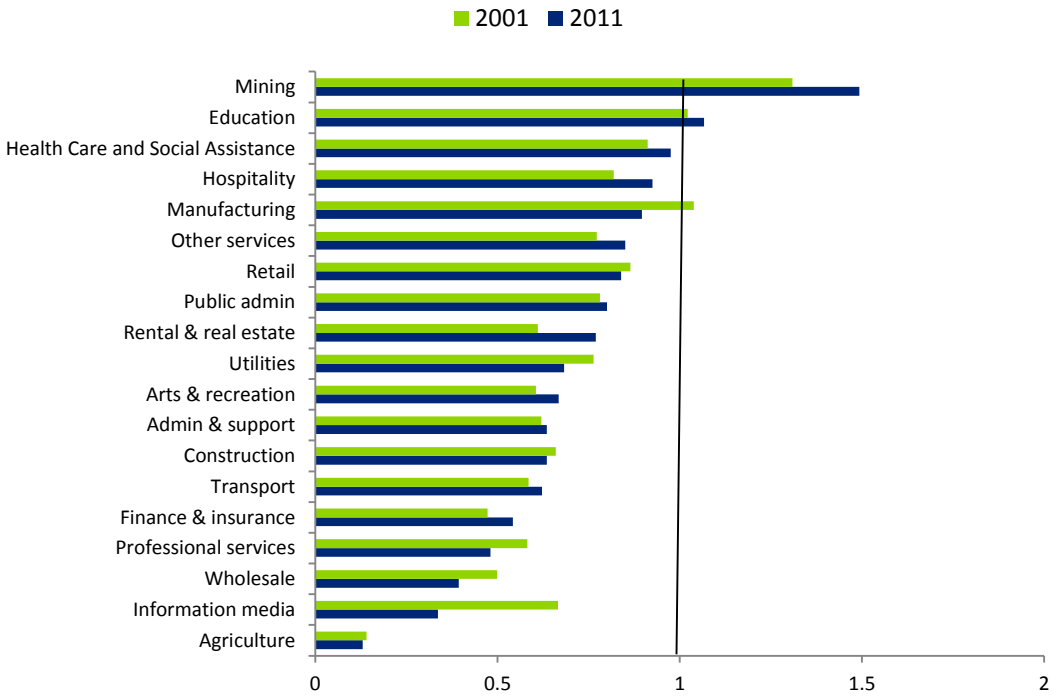
3.4 Business/industrial development

3.4.1 Diversifying the Illawarra's industries

The Illawarra region has, and will likely continue to have for some time to come, a relatively high share of its economy devoted to the mining and manufacturing industries.

Chart 3.7 compares the Illawarra region's share of total industry employment with its share of population at the 2001 Census and the 2011 Census. A ratio greater than 1 means the region's share of total industry employment exceeds its share of population, and vice versa. For example, in 2011, the Illawarra region accounted for about 6% of the State's mining workforce, but only 4% of its population. This means the region significantly 'punches above its weight' when it comes to mining employment.

Chart 3.7: Illawarra region's share of State employment by industry (relative to share of State population)



Source: 2001 and 2011 Census

However, by comparing 2011 with 2001, Chart 3.7 shows the beginnings of structural change within the Illawarra's workforce. Manufacturing and utilities are two notable industries in which the region's relative abundance of workers has declined over the past decade. Information media is another example, however this reflects structural change within the sector (digitisation and a shift from paper based to internet based newsprint, for example), and does not take away from the opportunities offered by an expanding IT sector (see section 3.3).

By contrast, sectors that have increased their relative abundance – with the exception of mining, which has been driven by the mining boom between 2001 and 2011 – are all predominately white collar professions with supporting service workers. It is also worth noting that a higher number of industries had a ratio greater than 1 – i.e. the Illawarra's share of State employment in that industry exceeded its share of State population – in 2001 than in 2011. As shown in Appendix B, the Illawarra's share of employment relative to its share of population has shown a steady decline since 1995-96.

But despite the region's traditional (and continued) reliance on blue collar industries, it is clear that some diversification is beginning to take place, with a greater emphasis on the services sectors today relative to 10 years ago, and with that trend looking set to continue.

And, in some ways, the strength of the region's manufacturing industry has actually stimulated research and development in related sectors:

> *The Illawarra region has become home to a group of complementary businesses that provide specialised mining and steel making technology, metal*

and mineral processing, engineering design and project management, high quality steel fabrication and construction services. These deep capabilities form the foundation of the region's manufacturing competitive advantage. (Grace, 2013).

The future of manufacturing

Manufacturing is a very significant industry in the region. According to the 2011 Census, it is the 4th largest employer in the region and according to information provided by the Australian Industry Group, the manufacturing industry was the largest contributor to output of the Wollongong economy.

Manufacturing has been important in the region's development and will continue to play an important role in the future. According to our analysis, manufacturing ranks well in terms of export potential and in terms of comparative advantage given its high levels of employment in the region. However, manufacturing has not fared well in terms of employment growth because in recent years big manufacturers such as BlueScope steel have scaled down their operations in the region.

At the same time, it is worth acknowledging that manufacturing is changing, becoming more highly value add, with niche products and using cleaner technology. Thus while manufacturing in the traditional sense is declining it is also attracting new technologies, and thus renewing the industry. Examples which reflect this trend include:

- Illawarra Innovative Industry Network (I3net);
- Aquahydrex Pty Ltd - which based on technology originating from the UOW-headquartered Australian Research Council Centre of Excellence for Electromaterials Science (ACES) and its partners at Monash University – was awarded $2.2 million under the Clean Technology Innovation program to produce the cost-competitive alternative to fossil fuel-based hydrogen; and
- Additional funding has also been provided by the government to help UOW's Intelligent Polymer Research Institute (IPRI), the lead node of multi-institutional ACES, to work with AquaHydrex to drive research and development of technology to produce low-cost hydrogen with a greatly reduced carbon dioxide footprint.

This trend reflects the importance of innovation in the emerging manufacturing sector, which will be more intensive in R&D.

Detailed analysis of manufacturing in the region was carried out by Enterprise Connect (2012), in partnership with RDA Illawarra. Enterprise Connect assessed the region's capacity, capability and level of interest in supplying to the clean technology sector, and identified specific clean technology product and service opportunities that small and medium enterprises (SMEs) in the region may be able to address.

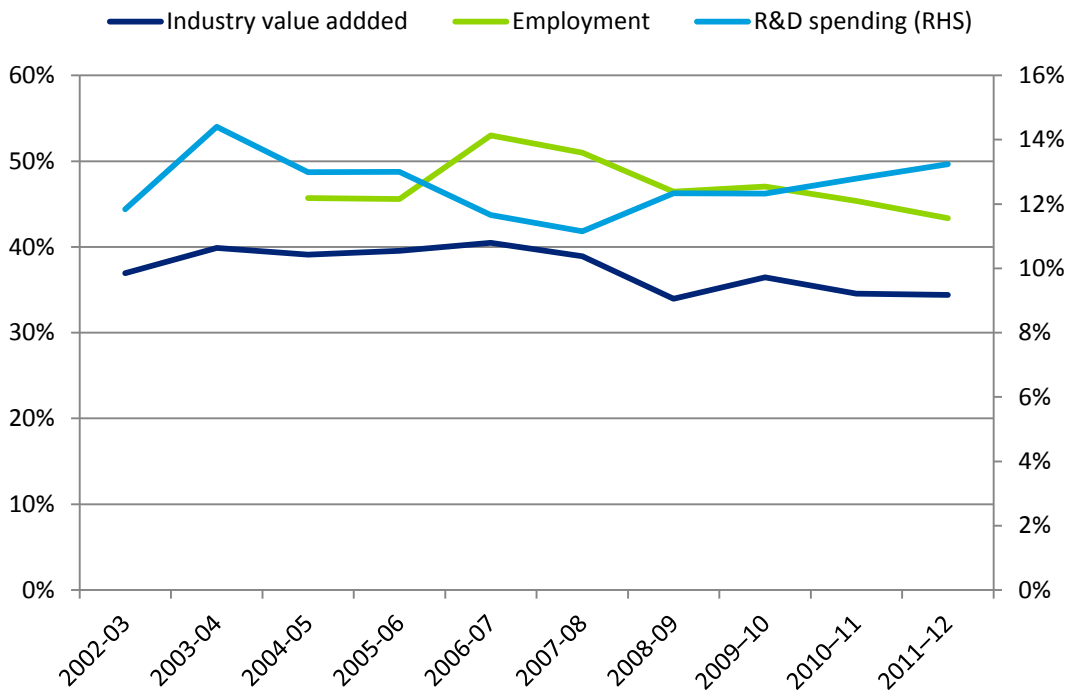
The Enterprise Connect report contained a number of important recommendations for enhancing manufacturing in the region and interested readers are encouraged to consult this report for further details on the prospects for clean manufacturing in the region.

3.4.2 Business size

Business size can have major impacts on a firm's capacity to innovate and generate steady employment growth. The ABS defines a small business as any business that employs fewer than 20 people. Although such businesses account for about 95% of all businesses in Australia, they account for only a third of industry value added, 43% of employment, and about 13% of total spending on research and development (Chart 3.8).

The chart also shows that small business' contribution to total value added and employment has fallen sharply since the GFC. In part this reflects the importance of large scale resources investment to Australia's economy in recent years, but it also shows that in general smaller businesses are more susceptible to economic downturns than larger ones.

Chart 3.8: Small business' contribution to key aggregates



Source: ABS 8155; ABS 8104

Note: Small businesses are defined as any business that employs fewer than 20 people.

There are a number of salient differences between small and large businesses. These can be thought of in terms of four key barriers that almost all small businesses face, and that limit the extent to which small businesses contribute to regional and/or State and national economies.

- ***Cost barriers:*** Through economies of scale, large scale businesses have a lower cost structure. The Illawarra's abundance of small businesses may find it hard to achieve economies of scale. That said, technological change may reduce some of these barriers.
- ***Workforce barriers***: Small businesses offer limited career progression and less scope for wage increases than large businesses, which often hinders their ability to attract the best talent.
- ***Information barriers***: Small businesses often face an inherent problem of asymmetric information – whereas larger businesses have the resources to be on top of latest developments and thinking, small businesses often lack the expertise (or the resources to hire that expertise) required to truly succeed.
- ***Funding barriers:*** Small business often find it difficult to access bank loans since they are perceived to be more risky (see, for example, DIISR 2011). According to the latest RBA statistics, on average over the past ten years, small businesses have had to pay interest rates of approximately 2% more on their loans than large businesses.

In addition to facing the above barriers, small businesses in regional centres such as the Illawarra also face a 'geographic barrier', in the sense that their readily accessible market is fairly limited, as well as access to advice or other forms of support. However, technological change is acting to reduce these geographical barriers.

As shown in Table 3.1, the Illawarra's business structure (in terms of business size) is not significantly different to NSW's - about 96% of all businesses in both the Illawarra region and NSW have fewer than twenty employees, while about 61% of businesses in the Illawarra and 63% of businesses in NSW have total annual turnover of less than $200,000.

Focussing on revenue (i.e. defining a small business as one with less than $200,000 a year in turnover), industries with a different business structure in the Illawarra compared to NSW include mining, the utilities and IT. The latter reflects the fact that major IT firms have not made a home in the Illawarra, with the Innovation Campus tending to attract mainly small to medium sized firms.

At both the State and the regional level, about 45% of all small businesses are in the private services industries (mostly financial and professional services). The next biggest contributor is construction, though it accounts for a larger share of the Illawarra's small businesses (18%) than it does of NSW's (15%). This likely reflects the fact that the vast majority of the Illawarra region's construction activity is in the residential sector (large scale commercial and industrial complexes tend to be built by larger construction firms).

Table 3.1: Small business share by industry, Illawarra vs NSW

	Small business (< 20 workers) share of total businesses		Small business (<$200k) share of total businesses		Industry share of total small business (<$200k)*	
	Illawarra	*NSW*	*Illawarra*	*NSW*	*Illawarra*	*NSW*
Agriculture	98%	98%	80%	70%	3%	8%
Mining	100%	95%	33%	62%	0%	0%
Manufacturing	93%	91%	51%	49%	3%	3%
Utilities	80%	94%	20%	50%	0%	0%
Construction	98%	98%	65%	64%	18%	15%
Wholesale and retail	93%	94%	39%	45%	7%	8%
Hospitality	82%	86%	37%	40%	3%	3%
Transport	98%	98%	74%	76%	8%	8%
Information media	92%	95%	83%	69%	1%	1%
Private services	97%	98%	68%	70%	45%	45%
Public services	96%	95%	52%	52%	8%	6%
Overall	96%	96%	61%	63%		

Source: ABS 8165

*Total does not add to 100 because it excludes businesses of unknown industry

A wide range of assistance is available for small businesses. Generally, such assistance focuses on free or subsidised advisory services – that is, addressing the information barriers noted above. Occasionally assistance is provided by way of cash grants or loans – that is, addressing the funding barriers noted above.

Economic gardening (EG) is a community based initiative that can assist growth oriented small businesses with developing a corporate strategy, optimising marketing approach (such as using social media and eCommerce), and connecting them with customers and clients.

There are many small business assistance programs, all of which are aimed at alleviating (or if possible, eliminating) one or more of the barriers faced by small businesses in seeking to expand. These barriers can be broadly classified as cost, workforce, information, and funding.

Grace (2011) notes four key differences between EG and 'traditional' small business assistance programs:

- Whereas many programs focus on group information sessions and workshops, EG focuses on identifying and formulating effective business development strategies for individual businesses.
- Most programs are aimed primarily at improving business survival rates, whereas EG is aimed at growth and innovation oriented businesses.
- Most programs are top-down, with centralised design and administration, whereas EG programs are community specific, bottoms up programs; an EG program in the Illawarra need not be the same as one in, say, the Hunter.
- Most programs are facilitated by 'visiting experts', whereas EG aims to build local expertise, and is delivered by local businesspeople, who not only know the region but

also provide a potential side benefit by way of contacts and networking opportunities.

While clearly EG is not the only tool available to businesses, its focus on growth oriented business suggests it may be a positive tool for enabling local businesses to tap into potential markets and expand their customer base.

In late 2012 a report detailing the results of a survey of EG participants (IRIS 2012) argued that EG had delivered a strong positive effect on the regional economy. However, the study only surveyed EG participants, without surveying a control group – i.e. a group of companies that did not participate in the EG program.

Deloitte Access Economics recommends that further research be commissioned to investigate the impacts that participation in EG has had on companies' employment and profitability.

3.5 Growth in Sydney

The rapid growth of Sydney's southern and western suburbs is clear evidence of the continuing urbanisation of the metropolitan area. As higher rents and housing values squeeze people further and further from the CBD, opportunities exist for the Illawarra to position itself as an alternative place to live, a trend that might be intensified as technological change increases the capacity to work from home and/or as transport links between Sydney and the Illawarra improve.

3.5.1 Journey to work

Almost 30% of employed Illawarra residents travel outside of the region for work. About 40% of these commuters are employed in the services industries, with a further 20% employed in manufacturing and construction. Half of all commuters, amounting to about 15% of all employed residents, work in Sydney.

Such a high share of commuters is often viewed as a negative for the region – if 30,000 Illawarra residents commute outside of the region for work, some argue that this reflects an inability of the region to create sufficient jobs for 30,000 people.

However, this argument ignores the broader gains that can be made both to the Illawarra region and the economy as a whole by its workers going to where their skills are best utilised. It is also likely to be true for many Illawarra residents working in Sydney that the most relevant alternate case is not that the job would be instead located in the Illawarra – it is that the worker would instead reside in Sydney, or another part of Sydney's hinterland which competes with the Illawarra.

A finance worker living in Wollongong, for example, is likely to find better job and career opportunities in Sydney. Hence that worker will earn more money over his or her lifetime, and thereby pay more taxes and spend more money over his or her lifetime, by working in Sydney rather than in Wollongong. Put simply, the Illawarra region is never going to have the finance sector, or the construction industry, of Sydney and its surrounds. Hence, an

opportunity for the Illawarra lies in enticing these workers to live in the region and commute outside of the region for their places of work.

A detailed assessment of the economic contribution that Sydney based commuters make to the Illawarra economy is beyond the scope of this study. That said, analysis of aggregate spending data suggests that the contribution is significant.

People generally make a bigger economic contribution to their place of residence than their place of work, solely because they tend to spend most of their money where they live, not where they work. A breakdown of overall spending by location (i.e. place of residence or place of work) is not available, however aggregate household spending data (Table 3.2) show that the majority of households' expenditure is likely to benefit the local economies that they live in, rather than those that they work in.

Rent and mortgage payments, for example, will flow to real estate agents near the place of residence, or to nationwide lending institutions. Similarly, the majority of food expenditure will flow to supermarkets near the place of residence, while the majority of other spending will also likely take place near a person's home.

Table 3.2: Average household expenditure by item

Item	Weekly expenditure ($)
Rent/mortgage payments	238
Domestic fuel and power	32
Food and non-alcoholic beverages	213
Alcoholic beverages	33
Tobacco products	11
Clothing and footwear	46
Household furnishings and equipment	53
Household services and operation	70
Medical care and health expenses	64
Transport	198
Recreation	163
Personal care	26
Miscellaneous goods and services	118
Total goods and services expenditure	**1,265**

Source: ABS 6530

This is not to say that the region should not seek to expand its own workforce – a growing workforce is, after all, a key driver of economic growth. In a number of industries the Illawarra has strong potential to establish itself as a key focal point – health, education, and transport, for example.

But the Illawarra's proximity to Sydney means a sizeable share of its workforce will always commute to Sydney.

While building the region's workforce is certainly an important goal, attention should also be given to enhancing the region's appeal as an alternative place to live. More broadly, the Illawarra's strategic plans should focus on complementing Sydney, rather than competing with Sydney.

Over the longer term, the more Sydney based workers decide to live in the region, the more attractive and feasible it will become for businesses to open offices in the region.

3.5.2 Urbanisation trends

Over time there a number of factors have contributed to a shift towards higher density living, chief among them growth in land values and associated housing prices.

The Illawarra's 'country feel' is undoubtedly a big drawcard for those looking to escape the city, and this will continue to be the case looking forward. But the Illawarra itself is seeing a shift towards higher density living – the Illawarra Urban Development Plan (Department of Planning & Infrastructure, 2012) notes that at the beginning of the last decade, the split of dwelling completions was around 70% detached dwellings and 30% multi-unit dwellings. Today, the split is closer to 50-50.

A number of urban investments are currently underway, including Stockland's $330 million redevelopment of its Shellharbour shopping centre, GPT Group's $200 million redevelopment of the Wollongong Central shopping centre, and Wollongong Council's $45 million redevelopment of the 'blue mile,' which stretches from Flagstaff Hill to North Beach in Wollongong. These are all positive steps in the move toward a more urbanised and connected Illawarra region.

Anecdotally, some stakeholders have commented that the Illawarra is something of a 'cottage economy'– an area with much potential, but where a lack of infrastructure is holding it back. Infrastructure needs are discussed further in Chapter 4.

3.5.3 Tourism

Another potential opportunity for the region resulting from its proximity to Sydney is in expanding its tourism sector. Tourism is a relatively small industry in the Illawarra, especially given its natural amenity and its proximity to Sydney. According to Wollongong City Council, the tourism sector (a combination of activities related to tourism across a number of industries, such as hospitality, arts and recreation and personal services) accounts for just 5% of the region's employment and 3% of its economic output. These shares are lower than the State average – which is somewhat surprising given the natural amenity the region has to offer.

A common view among stakeholders is that the Illawarra region has considerable potential to increase tourism, but that a lack of infrastructure is holding it back.

The majority of tourism to the region is in the form of domestic day trips, which explains why tourism is a relatively small contributor to the region's economy – Wollongong City Council notes that domestic day-trippers to the area spend an average of $84 per trip, compared to $419 for domestic overnighters, and $1300 for international visitors.

Table 3.3 presents key tourism statistics – rooms, occupied room nights, average length of state and occupancy rate – for key statistical areas within the Illawarra. In an aggregate sense the Illawarra is clearly lagging behind the State average – less room availability, less occupied room nights and a lower occupancy rate.

About two thirds of occupied room nights were in Wollongong, with a further quarter in Kiama and the Kiama Hinterland. The remainder was made up by Berkeley-Warrawong-Windang and Shellharbour-Flinders. It is easy to understand that a lack of tourism infrastructure is high among stakeholders' list of concerns about the region's future.

While Wollongong and Kiama appear to be well serviced by tourism infrastructure, it is important to keep in mind that the ABS data do not distinguish between the type of accommodation. For example Wollongong accommodation is mainly in the lower star categories, with relatively few 'luxury' accommodation options to entice tourists to the region.

Table 3.3: Tourism infrastructure

Area	Rooms per 1000 people	Room nights per 1000 pop	Length of stay	Occupancy rate (%)
Berkeley - Warrawong - Windang	5	136	1.5	28
Kiama	25	1599	2.1	72
Kiama Hinterland - Gerringong	19	892	2.1	51
Shellharbour - Flinders	5	203	1.9	42
Wollongong	29	1726	2.4	65
Illawarra	7	398	2.3	62
Hunter	8	425	2.0	61
Central Coast	7	393	2.5	66
NSW	10	577	2.1	67

Source: ABS 8635, 3218.

Note: Tourism data reflect the March quarter 2013; population data as at 30 June 2012. The Illawarra region for this table is defined as the sum of the SA2 areas presented above, and as such is not directly comparable with the RDAI's definition of the region.

Understandably there is a reluctance to over-develop the region – there are concerns that a blind focus on tourism could result in the Illawarra becoming another Gold Coast. But large blocks of land – such as the coastal stretch from Wollongong down to Kiama, the area surrounding the Minnamurra rainforest along the coast, and the beach around Port Kembla - remain largely undeveloped, and could prove significant drawcards for both domestic and international tourists.

The region's proximity to Sydney airport provides considerable potential to extract value out of international tourists, for example, yet very few international tourists visit the region.

Stakeholders also raised the possibility of 'themed tourism' – tourism that highlights the region's historical manufacturing industry, for example. Tourism could also link into the region's future industry opportunities – hosting health conferences, for example, to showcase the Wollongong Hospital; hosting prospective foreign students to the UOW; or showcasing the region's digital capabilities, such as the Innovation Campus or the SMART infrastructure facility.

More broadly, regardless of what 'type' of tourism the region seeks to attract, there can be no doubt that a lack of suitable infrastructure is the main obstacle to expanding the region's tourism base. Infrastructure projects such as the $1.5 billion redevelopment of the

Shell Cove marina in Shellharbour provide are positive steps forward in attracting more tourists to the region.

3.5.4 Competition from other regions

The Illawarra is not the only region that stands to gain from the urban sprawl of Sydney. Suburbs in Sydney's west, for example, have benefited as high rents and land values have squeezed both residents and business out of the inner areas of Sydney. And perhaps most importantly, the Central Coast and Hunter region to Sydney's north also have the potential to benefit from Sydney's continued development.

The Central Coast region, which includes the local government areas of Wyong and Gosford, provides the greatest competition to the Illawarra region in terms of enticing Sydney based workers. The Illawarra and Central Coast regions have a domestic workforce of about the same size. Yet the Central Coast is home to about 23,000 Sydney based workers, whereas the Illawarra is home to only about 17,000 (Table 3.4).

Table 3.4: Residents' place of work, Illawarra, Central Coast and Newcastle

	Illawarra	Central Coast	Newcastle
Local	85,911	83,319	188,377
Sydney	16,717	23,077	8,139
Other NSW	13,518	20,712	29,897
Other	3,299	3,907	6,126
Local	72%	64%	81%
Sydney	14%	18%	4%
Other NSW	11%	16%	13%
Other	3%	3%	3%

Source: 2011 Census

The two LGAs of the Central Coast region, Gosford and Wyong, are 77km and 93km respectively from Sydney's CBD, approximately an hour to an hour and a half driving time. Wollongong is 84km from Sydney's CBD, and is also approximately an hour to an hour and a half drive. All are connected to Sydney via the City Rail network. Like Wollongong, the Central Coast has an office market of about 150,000 square metres, however this space is spread over a much larger area than Wollongong.

So Wollongong faces fierce competition from the Central Coast in two of its main opportunities: attracting Sydney based workers to live in the region and commute to work, and attracting Sydney based businesses to establish a presence in the region. In other words, both the Illawarra and the Central Coast could be considered as 'feeder regions' for Sydney's ever expanding workforce and property market.

Wollongong's greater education focus provides the Illawarra with an important competitive advantage over the Central Coast. If a Sydney based firm were to consider establishing a presence in one of Sydney's 'feeder regions', a ready supply of students from the UOW, combined with the presence of the Innovation Campus, would both serve as important drawcards for the region.

Table 3.4 shows that the Hunter region is home to only about 8,000 Sydney based workers – so in terms of being an alternative place of residence for Sydney based workers, the Hunter does not provide as big a competition to the Illawarra region as the Central Coast does. As discussed in section 3.1, the main threat posed by the Hunter region is its greater pipeline of coal projects.

However, another source of competition from the Hunter region may be in the commercial market – with a total office space of 250,000 square metres compared to Wollongong's 150,000 square metres, Newcastle is simply a bigger office market, and so firms considering establishing a presence outside of Sydney may well prefer Newcastle over Wollongong. (Newcastle also shares the advantage of a well-regarded university that provides a ready stream of students and graduates).

3.5.5 Housing market

For the region to truly take advantage of its proximity to Sydney, it needs a strong housing market, which will generate both demand for housing, as well as a solid employment base through the construction of new housing.

However, the Illawarra's housing market has been in a downward spiral for some time now, with all of its indicators pointing to slow housing activity. Slow employment growth has been followed by slow population growth, slow population growth has reduced overall housing demand, less demand for housing has kept property values depressed, and low property values has provided little incentive for developers and investors to enter the market.

But there are some positive signs. Over the short term, there are some key supports for property price growth:

- The Australian cash rate is at a record low, and mortgage interest rates are near a record low. The lower cost of financing creates a significant improvement in housing affordability. Regardless of whether the Reserve Bank cuts rates further, odds are that they will stay low for some time.
- Low interest rates also mean that, relative to other assets, housing now looks to be providing a strong return. The rental yield on houses is now showing a 1% premium to the bond rate, compared to a longer term average of a 1% discount. In other words, low returns in bond and stock markets have combined to make housing a relatively attractive investment choice.

3.5.6 Office/commercial market

Wollongong's office market enjoys considerably cheaper rents than other major markets – according to Wollongong City Council (2012) prime office space in Wollongong's CBD rents for $380 per square metre, less than half the corresponding rate in Sydney. However, Herron Todd White (2012), a real estate valuation company, notes that office rents in Wollongong are comparable with many suburban Sydney markets, limiting the ability to attract external tenants.

And, perhaps more importantly, slow rental growth stymies development activity – developers will not build if they lack confidence in future rental growth. In general, rents in

Wollongong are simply too low to stimulate future development (Herron Todd White 2012).

The upshot is that Wollongong's office market has remained stagnant, with its office stock ageing. This further reduces the attractiveness of Wollongong as an office locale – with offices that are generally older and less energy efficient than competing Sydney markets, the region struggles to attract new tenants. In other words, the city faces a cycle of low demand: prospective tenants demand premium, 'A grade' office space, but developers are discouraged from building such office space due to a lack of rental growth.

This cycle can clearly be seen in Table 3.5, which compares the vacancy rates of various office grades in Wollongong CBD versus Sydney CBD. It should be noted that the small size of Wollongong's office market means tenant relocations in just a handful of buildings can cause large shifts in overall vacancy rates, so the five observations below are not sufficient to establish a clear trend as such.

Broadly speaking though, low vacancy rates in 'A grade' office space indicate a lack of availability of 'premium' office stock. But the only way to explain persistently high vacancy rates in the lesser grades of office stock is that these are not an adequate substitute for premium office stock. Rather than make do with lesser grade stock, many of these prospective tenants are simply relocating to other markets.

Table 3.5: Office market vacancy rates, Wollongong CBD vs Sydney CBD

Wollongong	Jan-08	Jan-09	Jan-10	Jan-11	Jan-12	Jan-13
A grade	0.2	0.5	0.5	0.4	0.6	2
B grade	10.2	13.7	13.5	17.7	8.1	9
C grade	5.8	12.7	15	15.9	13.6	11.4
D grade	21.9	16.4	1.3	8.2	12.1	9.5
Total market	5	7.9	8.1	9	6.5	6.6
Sydney						
A grade	1.7	4.7	6.6	9.4	9.2	7.4
B grade	3.7	5.2	8.8	8.1	10.1	7.2
C grade	3.7	5.4	8.2	8.3	9.7	7.2
D grade	3.7	5.4	8.2	8.3	9.7	7.2
Total market	3.7	5.4	8.2	8.3	9.7	7.2

Source: Property Council of Australia

One sign of life in Wollongong's office market is the UOW's Innovation Campus discussed earlier, which according to Herron Todd White has been successful in securing tenants with rental rates of around $400 per square metre. The campus's new and energy efficient office buildings mean it may well become a more attractive office locale than the CBD. Indeed, some of the tenants discouraged by a lack of 'A grade' stock in the CBD may well have relocated to the Innovation Campus.

Separate and strategically located business parks have been hugely successful in other cities – in just over ten years the business precinct at Canberra's airport, for example, has risen from nothing to over 200,000 square metres of office space, about the equivalent of Wollongong's entire office stock (including the CBD as well as the Innovation Campus). The key drawcard for that market has been direct proximity to the Canberra Airport; the Innovation Campus's key drawcard is direct proximity to a ready supply of students at the

UOW. The business park at the Canberra Airport provides a recent example of the potential of such complexes, and perhaps provides a good indicator for the potential of the Innovation Campus.

Overall however, a stagnant office market hinders the Illawarra's capacity to truly capitalise on its proximity to Sydney. As Sydney grows and CBD office space becomes more and more expensive, marginal firms will spill out of the CBD. But currently, suburban Sydney markets seem a more attractive possibility to prospective commercial tenants than Wollongong.

4 Workforce future needs

This chapter presents forecasts of population growth, employment growth (by industry and occupation), and demand for skills and qualifications, for the Illawarra region over the next 20 years (to 2033).

The forecasts presented below represent our best estimate of how the Illawarra's workforce might look in twenty years' time, based on expectations for the region's population growth and a range of workforce trends. The forecasts are thus best considered as a central case, around which unexpected events can and will cause actual outcomes to differ from the central case presented below.

If key opportunities for the region are capitalised upon, for example the potential to attract an ever larger share of Sydney based workers to reside in the region, the forecasts presented below might prove an under-estimate. Conversely, if the region struggles to overcome some of the challenges noted above, such as a potential slowdown in Asia or competition from other regions, then the forecasts provided below might turn out to be an over-estimate.

It is also worth noting that the ABS's Labour Force Survey, on which these estimates are based, considers place of residence, not place of work. As such, the labour force forecasts discussed below should be interpreted as 'employed people who live in the Illawarra', rather than 'people whose place of work is located in the Illawarra'.

4.1 Projected population

Population forecasts for this report have been developed by Deloitte Access Economics, based on the most recent projections released by the NSW Department of Planning and Infrastructure (NSW DPI), and updated for more recent estimates of actual population movements.

By source, population projections have been derived using a combination of:

- Deloitte Access Economics' population projections for NSW (based from actual data to end-2012);
- NSW Government regional population projections (released earlier this year);
- Revised official population levels for regions in NSW (from the ABS, released at the end of August) for mid-2012; and
- Partial indicators from the Labour Force Survey (which gives regional population aged 15+ up to September 2013).

In effect, we follow the official rates of relative growth by region as supplied by the NSW DPI, but we:

- Revise the starting point to the latest ABS results; and
- Adjust gradually from the historic rate of growth to the NSW DPI forecast rate of growth over a few years.

In the case of the Illawarra, ABS data shows that population growth for the last few years has been very weak, both in the official total population levels (up to June 2012) but also in the partial labour force indicators available up to mid-2013. As a result, the starting point (2013) for our forecasts is much lower than the NSW DPI would have been using. Indeed, growth to mid-2013 is only roughly half that implied by the latest NSW DPI expectations. While growth rates within these forecasts recover over time (that is, they move back toward the longer term projections), they do not do so instantly.

In other words, given slower than expected population growth over the last few years, the previous NSW DPI forecasts now seem overly optimistic. Overall, the NSW DPI forecasts had the Illawarra's population growing by around 42,000 people between 2011 and 2033; the forecasts in this report have it growing by around 32,000 people over the same period.

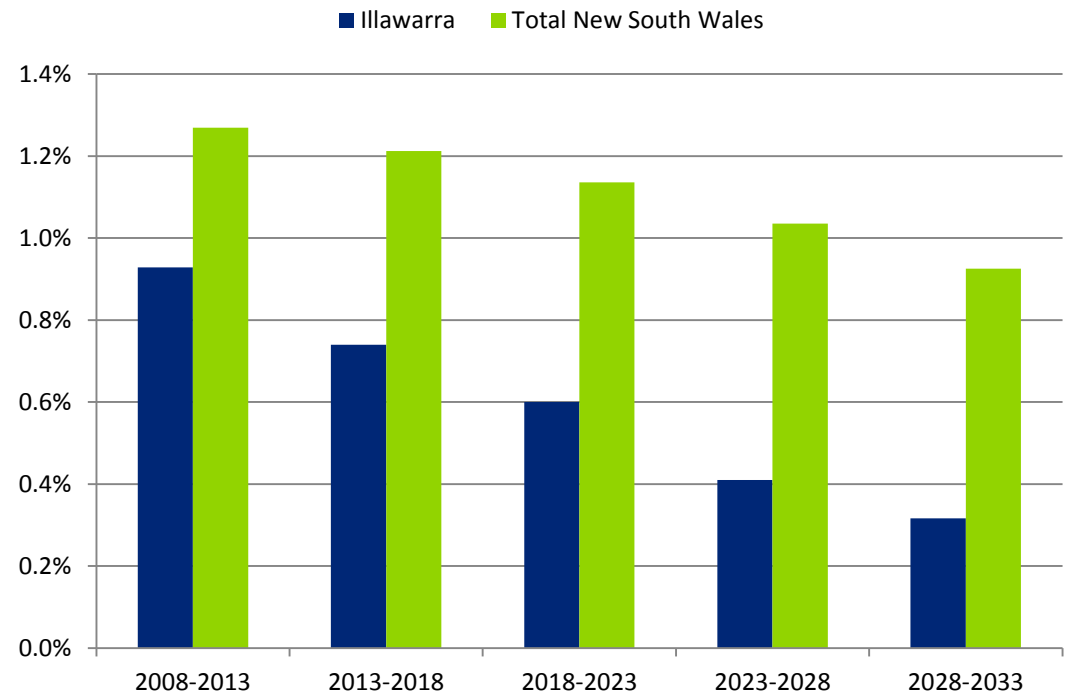
As shown in Chart 4.1, if the lacklustre population growth that has characterised the Illawarra region over the last twenty years continues over the next twenty years, average population growth will be around half the State average during each five year period from 2013 to 2033. This extrapolates recent industry and population trends.

The region remains over-represented in the manufacturing and mining sectors, where only slow employment growth is expected going forward. Modest growth would reduce the need for workers to move to the region, and would also encourage existing residents to leave the region in search of work.

Second, the demographic profile of the Illawarra region is ageing more rapidly than the State average. The age dependency ratio – expressed as the ratio of over 65 population to population aged 15 to 64 – is currently estimated at 26% for the Illawarra and 23% for NSW. By 2033, this could rise to 39% for the Illawarra and 32% for NSW. Hence, with growth in the number of females of child bearing age being outpaced by growth in the elderly population, expectations for overall population growth are reduced.

It is possible that higher population growth could occur, not only through policy initiatives outlined in this paper, but also with other economic and social changes not foreseeable today.

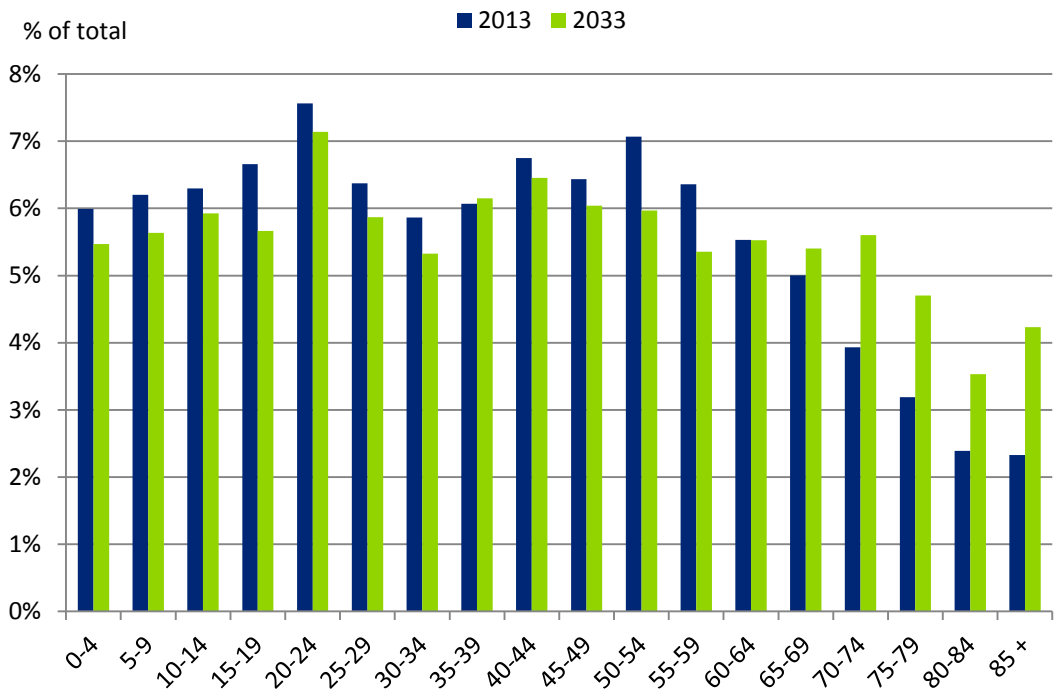
Chart 4.1: Projected population growth per annum, Illawarra vs NSW



Source: Deloitte Access Economics, based on NSW DPI

Chart 4.2 presents a detailed breakdown of the Illawarra's population, both today and twenty years from today, by five year age cohorts. The difference in each age cohort's contribution to total population between now and 2033 is quite striking, with the share of the oldest age cohorts projected to roughly double. In level terms, 85% of the total projected population growth between now and 2033 is expected to come from over 65s.

Chart 4.2: Age distribution of the Illawarra's population, 2013 and 2033



Source: Deloitte Access Economics, based on NSW DPI

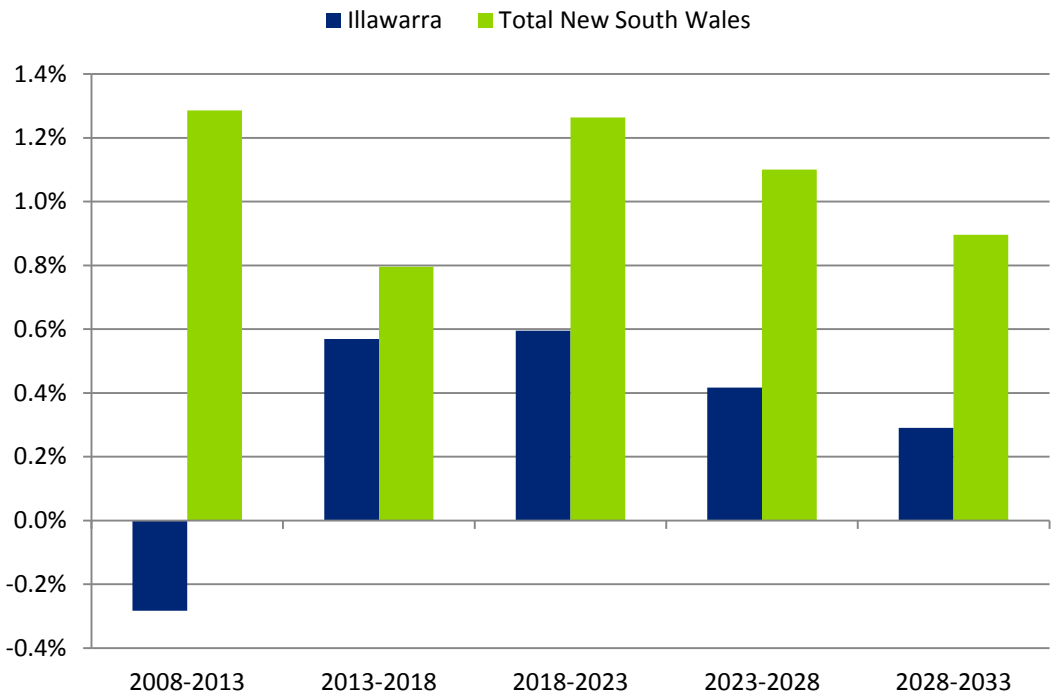
4.2 Projected employment

The expected rate of population growth provides a speed limit for expectations of overall employment growth. With slow rates of overall population growth, and a significant increase in the region's aged dependency ratio (more retirees relative to working-age population), the region's capacity to supply new workers will be limited.

Employment forecasts have been derived from Deloitte Access Economics' in-house workforce forecasting model, which combines detailed macroeconomic projections at a State level with expectations of inter-regional trends to develop forecasts of employment at a region level. Further detail on the forecasting methodology is provided in Appendix G. Note, however, that the forecasts are based on the ABS's Labour Force Survey (not the 2011 Census), and as such estimates of current employment levels referred to in this chapter may differ from the 2011 Census profile shown elsewhere in this report.

Over the next 20 years employment growth In the Illawarra is expected to average 0.5% per annum, compared with 1.0% for New South Wales as a whole.

Chart 4.3: Employment growth, Illawarra vs NSW



Source: ABS 6201; Deloitte Access Economics

4.2.2 Short term outlook by industry (2013-2018)

The health care sector has been amongst the strongest growth sectors of recent years, and is expected to be by far the biggest contributor to overall employment growth both over the next five years and twenty years.

The next five years is expected to continue to see reasonably strong growth in the region's mining related sectors, being mining itself, as well as construction and transport, with the latter also assisted by an expansion in other trade flows through Port Kembla, as discussed in section 3.1.

Putting aside health care, the next five years is expected to see white collar sectors such as professional services, administration, hospitality and other services gaining in importance.

It should be noted that although it has not been explicitly incorporated into the modelling, the continued push by RDA Illawarra and others to expand the region's IT sector may see employment in information media grow more strongly than the figures suggested below.

Over the next five years the biggest 'losers' are expected to be manufacturing and retail trade, which are expected to shed 1,060 and 840 workers respectively. The decline in manufacturing reflects the longer term structural decline in that sector. Retail on the other hand is in a period of cyclical decline, with employment in the sector estimated to have fallen sharply in the first three quarters of 2013. Low interest rates may provide some assistance to spark retail spending in the short term.

A short term decline in government sector employment (public administration) at the State level drives a similar decline at the Illawarra level.

Table 4.1: Projected employment growth by industry, 2013-2018

	Illawarra Persons	Illawarra % pa	NSW % pa
Health	2,335	2.8%	2.1%
Professional services	742	2.7%	3.4%
Admin and support	678	4.4%	2.1%
Mining	640	3.6%	3.0%
Transport	514	1.0%	1.1%
Construction	294	0.5%	0.8%
Hospitality	284	0.6%	-0.4%
Other Services	240	0.7%	0.2%
Education and Training	200	0.3%	0.3%
Information media	151	1.6%	0.6%
Wholesale Trade	129	1.1%	1.6%
Finance and Insurance	122	0.7%	1.4%
Arts and recreation	100	1.1%	1.1%
Rental and real estate	2	0.0%	4.7%
Utilities	-56	-0.7%	-1.7%
Agriculture	-168	-3.7%	-2.4%
Public admin	-555	-1.3%	-0.7%
Retail Trade	-840	-1.0%	-0.7%
Manufacturing	-1,060	-1.8%	-0.5%
Total	**3,751**	**0.6%**	**0.8%**

Source: Deloitte Access Economics

4.2.3 Medium to long term outlook (2018-2033)

The structural change that has pervaded the Illawarra's economy over the past two decades is expected to continue into the future. Table 4.2 presents forecasts for employment growth by industry for the latter fifteen years of the projection period (i.e. from 2018 to 2033).

Two key differences are worth drawing out. First, continued growth of coal exports in the near term is expected to continue to drive positive employment growth in the mining sector, and through it related industries such as transport and construction. Beyond 2018 however, the mining investment boom is projected to have well and truly peaked. As a result, although mining will remain a strong contributor to the local economy, employment in mining is projected to plateau beyond 2020, in line with expectations at the State level.

Second, over the longer term, even the best performing sectors such as education and health care are projected to grow relatively slowly in the Illawarra based on expectations for the region's population growth and its composition.

Table 4.2: Projected employment growth, 2018 to 2033, by industry

	Illawarra Persons	Illawarra % pa	NSW %pa
Education and Training	2,733	1.2%	1.8%
Health	2,651	0.9%	1.5%
Professional services	1,859	1.8%	2.4%
Public admin	1,443	1.1%	1.7%
Finance and Insurance	1,390	2.4%	3.0%
Transport	1,320	0.8%	1.3%
Hospitality	1,067	0.7%	1.2%
Retail Trade	664	0.3%	0.8%
Mining	266	0.4%	0.9%
Arts and recreation	222	0.8%	1.4%
Admin and support	145	0.3%	0.9%
Wholesale Trade	77	0.2%	0.8%
Rental and real estate	54	0.1%	0.7%
Information media	-52	-0.2%	0.4%
Other Services	-153	-0.1%	0.5%
Utilities	-266	-2.7%	-2.3%
Agriculture	-267	-1.2%	-0.6%
Construction	-1,082	-0.7%	-0.1%
Manufacturing	-3,064	-2.1%	-1.6%
Total	**9,007**	**0.6%**	**1.4%**

Source: Deloitte Access Economics

4.2.4 Overall employment outlook (2013 to 2033)

At the turn of the century manufacturing accounted for some 20,000 jobs in the Illawarra region, a figure that has shrunk to around 12,000 (as of June 2013). This decline is expected to continue throughout the projection period, with the manufacturing sector expected to shed around 4,000 jobs over the next twenty years, the equivalent of 3% of the Illawarra's current workforce.

That said, the level of manufacturing output is expected to keep rising over time, with that output growth driven largely by productivity gains. It is also likely that there will be some niche areas within manufacturing where employment growth is seen over time.

The fastest growing sector over the next twenty years in absolute terms is expected to be health care, driven primarily by an ageing population, with the sector's workforce expected to grow by the equivalent of nearly 4% of the region's total employment base over the next twenty years. Education and training is also expected to grow strongly, by around 3,000 workers over the next twenty years, driven primarily by continuing strength of the region's vocational and tertiary education offerings.

As noted in section 3.2, the projected growth in the region's health sector brings with it enormous opportunities for the region's educational base.

Strong growth is also expected in the services sectors, with professional and administrative services leading the pack in terms of average annual growth over the projection period. Hospitality employment is also expected to grow reasonably strongly, partly due to a

continuation of current trends (employment in the sector grew at 2.4% a year over the ten years from 2003 to 2013), including a further increase in day tourism from Sydney.

Finally, the transport sector is expected to see strong growth over the period, of around 2,000 workers and with an average annual growth rate nearly twice the regional total. Two key trends loom positive for the transport sector over the projection period – first, the expectation of additional coal exports through Port Kembla in the short term, followed by potential longer term switching into containerised trade and other exports. Further, growth in online retailing will drive greater demand for transportation and storage services within the region (particularly given Port Kembla's potential as a key import point for online purchased goods).

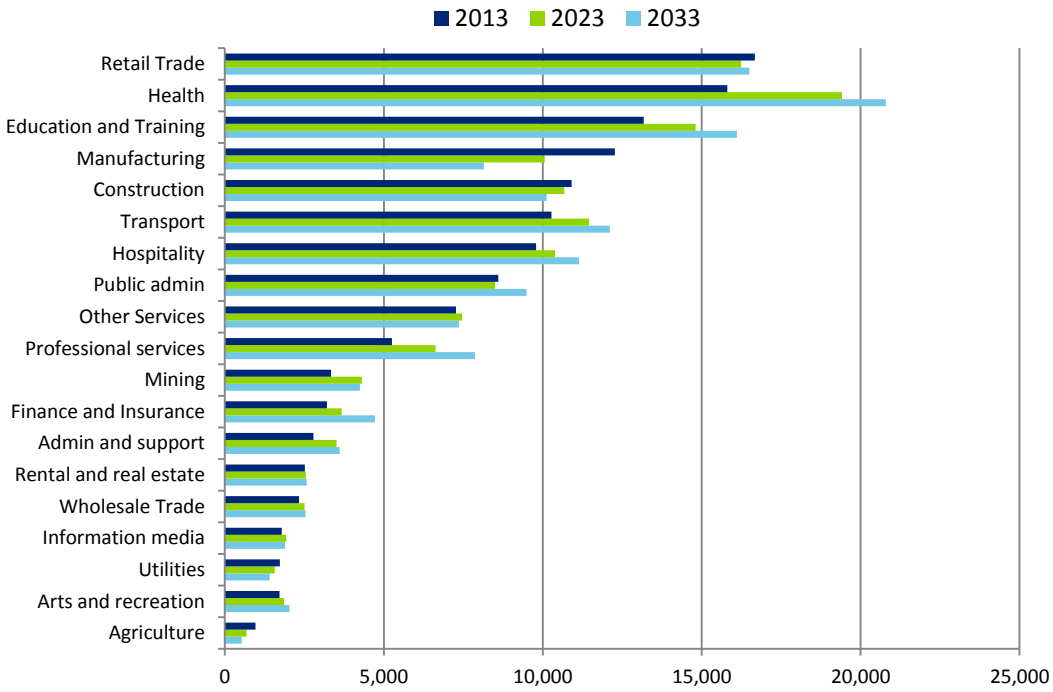
Table 4.3: Projected employment growth, 2013 to 2033, by industry

	Illawarra Persons	Illawarra %pa	NSW %pa
Health	4,986	1.4%	1.7%
Education and Training	2,933	1.0%	1.4%
Professional services	2,601	2.0%	2.7%
Transport	1,834	0.8%	1.3%
Finance and Insurance	1,512	1.9%	2.6%
Hospitality	1,351	0.6%	0.8%
Mining	906	1.2%	1.4%
Public admin	888	0.5%	1.1%
Admin and support	823	1.3%	1.2%
Arts and recreation	322	0.9%	1.3%
Wholesale Trade	206	0.4%	1.0%
Information media	99	0.3%	0.4%
Other Services	87	0.1%	0.4%
Rental and real estate	56	0.1%	1.7%
Retail Trade	-176	-0.1%	0.4%
Utilities	-323	-1.0%	-0.9%
Agriculture	-434	-2.9%	-2.3%
Construction	-788	-0.4%	0.1%
Manufacturing	-4,124	-2.0%	-1.3%
Total	**12,759**	**0.5%**	**1.0%**

Source: Deloitte Access Economics

By 2033 health care will be well and truly the region's biggest employer (currently it is just behind retail), followed by retail and education, which will compete for second and third place. The biggest shift will be in manufacturing, which is projected to slip from the region's fourth largest employer currently, to only the eighth largest employer by 2033.

Chart 4.4: Illawarra employment by industry, 2013, 2023 and 2033



Source: ABS 6291; Deloitte Access Economics

4.2.5 Detailed industry categories

Employment forecasts have also been developed for detailed industry categories. A full suite of employment forecasts at the 3-digit ANZSIC level for the Illawarra is provided in Appendix H.

This section splits out employment forecasts by industry category within what is expected to be the top three growing industries (health care, education and professional services) for the region.

Health care employment is projected to exhibit strong growth across the board, at both a regional and a State level. In absolute terms the biggest growth is expected to come from hospitals, which accounts for about a quarter of employment in the health care and social assistance sector. Relatively speaking though, non-hospital sectors are projected to grow faster. The strongest growth is expected in child care, which reflects a continuation of current trends – over the past ten years, child care employment grew by roughly 6% a year at the State level.

Adult and community education is expected to be the strongest growing sub-sector of the broader education industry, with this sector in part benefitting from an expanding retiree population looking to keep learning. Tertiary education is also expected to record strong growth, reflecting the opportunities for growth at the UOW.

Roughly half of the overall growth in professional services is expected to come from legal and accounting services (30%) and architectural, engineering and technical services (20%). Despite accounting for 24% of current employment, computer services are expected to

account for 20% of overall growth. However as noted above, further development of the UOW's strength in IT, and in particular its Innovation Campus, provides considerable upside potential to the forecasts presented here.

Table 4.4: Projected employment growth, 2013 to 2033, three strongest industries by detailed categories

	Illawarra (persons)	Illawarra (% p.a)	NSW (% p.a.)
Health care and social assistance	4,988	1.4%	1.7%
Hospitals	1,053	1.2%	1.5%
Medical Services	533	1.3%	1.6%
Pathology and Diagnostic Imaging Services	252	1.7%	2.0%
Allied Health Services	645	1.4%	1.7%
Other Health Care Services	178	1.6%	1.9%
Residential Care Services	806	1.3%	1.5%
Child Care Services	705	2.0%	2.3%
Other Social Assistance Services	816	1.3%	1.5%
Education and training	2,932	1.0%	1.4%
Preschool Education	119	1.1%	1.5%
School Education	537	0.4%	0.8%
Tertiary Education	1,074	1.0%	1.4%
Adult, Community and Other Education	1,195	2.8%	3.2%
Professional services	2,599	2.0%	2.7%
Scientific Research Services	182	2.4%	3.0%
Architectural, Engineering and Technical Services	732	2.0%	2.6%
Legal and Accounting Services	711	2.1%	2.8%
Advertising Services	77	2.4%	3.1%
Market Research and Statistical Services	11	0.2%	0.9%
Management and Related Consulting Services	302	2.4%	3.1%
Veterinary Services	80	2.6%	3.2%
Other Professional, Scientific and Technical Services	97	3.3%	3.9%
Computer System Design and Related Services	407	1.7%	2.3%

Source: Deloitte Access Economics

Notes: (1) due to small sample size educational support services are not reported separately, but are included in the total; (2) due to rounding the industry totals in this table do not exactly match the 1-digit totals reported above.

4.3 Projected employment by occupation

4.3.1 Major occupational groups

On an occupational basis, there are some notable differences in rates of employment growth expected in the Illawarra over the next two decades. Managers, professionals and community and personal service workers are expected to dominate overall employment gains, with strong rates of growth seen over the 20 year period.

All other major occupational groups are expected to see employment levels decline. Note however, that this does not mean there may not be pockets of growth within these occupational categories. It also does not mean there will not be demand for new entrants

into these occupational groups – even with no employment growth there is a need to replace those workers who will retire over time, or who move on to other occupations.

Table 4.5: Projected employment, 2013 to 2033, by occupation

	2013	2023	2033	Growth p.a. 2013-2033
Managers	15,504	19,114	22,528	1.9%
Professionals	27,738	33,001	36,557	1.4%
Technicians and Trades Workers	19,543	18,420	16,564	-0.8%
Community and Personal Service Workers	13,755	16,192	19,089	1.7%
Clerical and Administrative Workers	18,376	17,098	15,076	-1.0%
Sales Workers	13,001	12,656	12,210	-0.3%
Machinery Operators And Drivers	10,645	10,329	10,240	-0.2%
Labourers	11,958	11,491	10,776	-0.5%
Total	**132,533**	**140,324**	**145,073**	**0.5%**

Source: Deloitte Access Economics

There are two drivers of projected occupational employment. The first is simply the industries in which workers employed as a particular occupation predominately work. The second driver is a degree of upskilling over time, as cost pressures and productivity gains favour the relatively higher skill occupations such as professionals and technicians, at the expense of relatively lower skill occupations such as sales workers and labourers.

Professional and community and personal service workers are strongly represented in what is expected to be the Illawarra's fastest growing industry sectors – health care, education and training, and professional services.

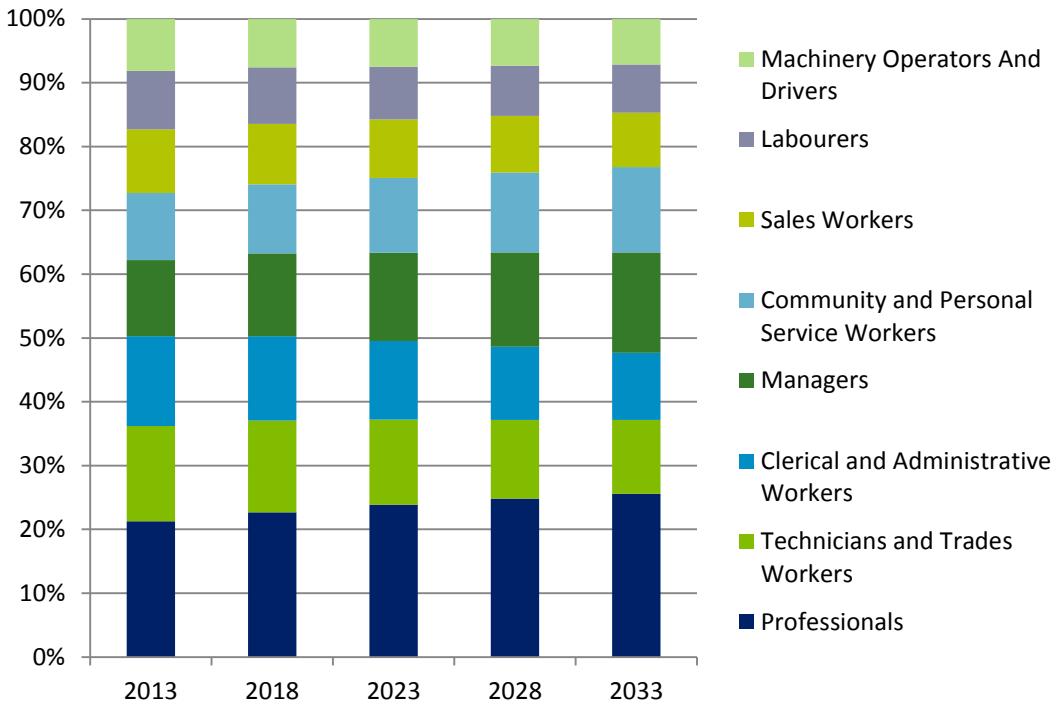
In addition, the upskilling of the workforce through time is likely to see a higher share of professionals in certain industries. For example, the share of health care workers classed as 'professionals' is expected to rise form 40% to 48% over the next 20 years, and the share of manufacturing 'professionals' is expected to rise from 12% to 16%.

Technicians, machinery operators and managers have a diverse industrial mix – swayed more towards slow growing industries such as agriculture and mining, manufacturing, construction, and wholesale and retail, which is why in general their numbers are projected to decline throughout the projection period.

Finally, labourers and sales workers, which are on the wrong side of both of the key occupational drivers – industry movements and upskilling – are projected to show declining employment levels throughout the projection period.

Chart 4.5 shows the projected structural change in the regional economy, continuing the trend of a gradual shift from blue collar to white collar workers that has already been occurring over the past two decades (see Appendix B).

Chart 4.5: Projected occupational composition of the Illawarra workforce



Source: Deloitte Access Economics

4.3.2 Detailed occupational categories

Employment forecasts have also been developed for detailed occupational categories. A full suite of employment forecasts at the 4-digit ANZSCO level for the Illawarra is provided in Appendix H.

This section splits out employment forecasts by occupational category within what is expected to be the top three growing occupations (community and personal service workers, professionals and managers) for the region.

The strongest occupational growth profile is expected for managers, driven in large part by specialist managers, which includes a broad range of occupations and is led by advertising and sales managers, production managers, construction managers and HR managers. Farmers and farm managers are expected to be in decline at both a regional and State level, but their relatively small number is not enough to detract from overall growth in managers.

Community and personal service workers are also projected to grow strongly, driven in large part by an ageing demographic profile. At both a regional and a State level, carers and aides, which includes child carers, education aides, aged and disabled carers, dental assistants, nursing support workers and special care workers, are projected to account for about 40% of growth in this category over the next twenty years.

Growth in professionals is expected to be led by education and health professionals. University lecturers and private teachers/tutors are notable standouts in the education category, expected to grow in excess of 3% a year over the next twenty years. Health professionals cover a wide range of occupations, most of which relate to acute care or

related work. The largest category is, unsurprisingly, registered nurses, who make up about a quarter of current employment, and are expected to account for about a third of total growth in this category over the next twenty years.

Table 4.6: Projected employment growth, 2013 to 2033, three strongest occupations by 2 digit ANZSCO categories

	Illawarra Persons	Illawarra %pa	NSW %pa
Community and personal services	5,334	1.7%	2.0%
Health and Welfare Support	748	2.0%	2.2%
Carers and Aides	2,168	1.9%	2.2%
Hospitality Workers	712	1.0%	1.3%
Protective Service Workers	666	1.4%	1.8%
Sports and Personal Service	1,040	2.0%	2.4%
Professionals	8,819	1.4%	2.0%
Arts and Media	175	1.0%	1.7%
Business, HR and Marketing	1,207	1.0%	1.7%
Design, Engineering, Science, Transport	1,017	1.1%	1.7%
Education Professionals	2,354	1.3%	1.9%
Health Professionals	2,197	1.7%	2.2%
ICT Professionals	731	1.6%	2.4%
Legal, Social and Welfare	1,138	2.3%	2.9%
Managers	7,024	1.9%	2.4%
CEOs, General Managers and Legislators	1,005	3.0%	3.7%
Farmers and Farm Managers	-173	-2.7%	-1.4%
Specialist Managers	3,835	2.1%	2.7%
Hospitality, Retail and Service Managers	2,357	1.6%	2.3%

Source: Deloitte Access Economics

4.3.3 Assessment of skill needs

Table 4.7 examines the extent to which the fastest growing occupations in the Illawarra region correspond to currently identified skills shortages. This tells us the extent to which the Illawarra's workforce needs are comparable with those at a national and/or State level, as well as the extent to which currently identified skill shortages have the potential to be significant issues for the Illawarra.

Three key metrics have been considered:

- The absolute expected growth in employment over the next twenty years;
- The relative expected growth in employment over the next twenty years; and
- The extent to which these occupations have been identified either in the Department of Employment's skill shortage lists or the Department of Immigration and Border Protection's *Skilled Occupations List.*

In total, four of the top 20 growing occupations have been identified in one of the abovementioned sources:

- Registered nurses
- Child carers

- Generalist medical practitioners
- Early childhood (pre-primary school) teachers

According to the most recent surveys from the Department of Employment, only 57% of vacancies for **registered nurses** in regional NSW were able to be filled, with particular difficulty experienced in filling aged care related positions. Only 17% of vacancies for **child care workers** in regional NSW were filled in 2011-12, with a lack of suitably qualified applicants cited as the main reason for not filling a vacancy. Similarly, only 29% of vacancies for **early childhood teachers** in regional NSW were able to be filled. Demand for early childhood teachers has increased in recent years due mainly to increased availability of child care services.

Persistent shortages of suitably qualified workers in the health care and social assistance industry might affect the availability of such services within the Illawarra region, which will ultimately hinder the potential growth of the region.

Notably, the majority of the top 20 projected occupations in the Illawarra region do not appear in the most recent official skill needs list. This tells us two things. First, that the occupations expected to experience the strongest growth in demand over the next two decades are not considered as experiencing a current shortage.

It also tells us that the skill needs of the Illawarra are likely to have some differences with national and State averages. Further, it should be noted that just because an occupation does not appear on a current skills needs list does not mean that it will not appear in future lists, nor that there is no shortage of such occupations at the Illawarra level.

Table 4.7: Assessment of current skill needs for key 20 detailed occupations (ranked by expected absolute growth in employment over 2013 to 2033)

Detailed (4 digit) occupation	Growth (number)	Growth (%)	Shortage
Retail Managers	758	24%	
Aged and Disabled Carers	706	54%	
Registered Nurses	683	25%	N, S, R, D
Drillers, Miners and Shot Firers	655	44%	
University Lecturers and Tutors	649	75%	
Child Carers	637	50%	N, S, R
Human Resource Managers	617	98%	
Health and Welfare Services Managers	596	174%	
Chief Executives and Managing Directors	517	77%	
Call or Contact Centre and Customer Service Managers	503	106%	
General Managers	493	86%	
Advertising and Sales Managers	483	35%	
Sports Coaches, Instructors and Officials	461	86%	
Secondary School Teachers	404	17%	
Other Building and Engineering Technicians	391	115%	
Nursing Support and Personal Care Workers	385	34%	
Construction Managers	373	49%	
General Clerks	367	14%	
Generalist Medical Practitioners	353	65%	D
Early Childhood (Pre-primary School) Teachers	352	94%	N, S, R, D

Source: Deloitte Access Economics, Department of Employment skill shortages lists; Department of Immigration and Border Protection Skilled Occupation List

N=shortage identified at national level; S=shortage identified at NSW level; R=shortage identified at regional level; D=occupation listed on DIBP's skilled occupation list.

4.4 Projected qualification profile

Deloitte Access Economics has also developed projections for expected post-school qualification needs in the Illawarra over time. Having skilled workers with the right qualifications in areas of employment need in the Illawarra will be critical to maximise the region's economic potential.

The ABS Survey of Education and Work is the best source of contemporary data on qualification trends at the one-digit ANZSIC and one-digit ANZSCO levels. It is supported by information from the 2011 Census in order to develop a profile of implied skill (post-school qualification needs) for the Illawarra workforce. The reporting of qualification levels is at broad levels based on the Australian Qualifications Framework:

- Postgraduate qualifications;
- Undergraduate qualifications;
- Advanced diploma / Diploma;
- Certificate III / Certificate IV; and
- Certificate I / Certificate II.

Table 4.8 shows the highest qualification level of employed persons in the Illawarra region over the forecast period, with average growth rates given for each five year period leading up to 2033. Note that some people hold more than one qualification; for those people only their highest qualification level is reported in this table.

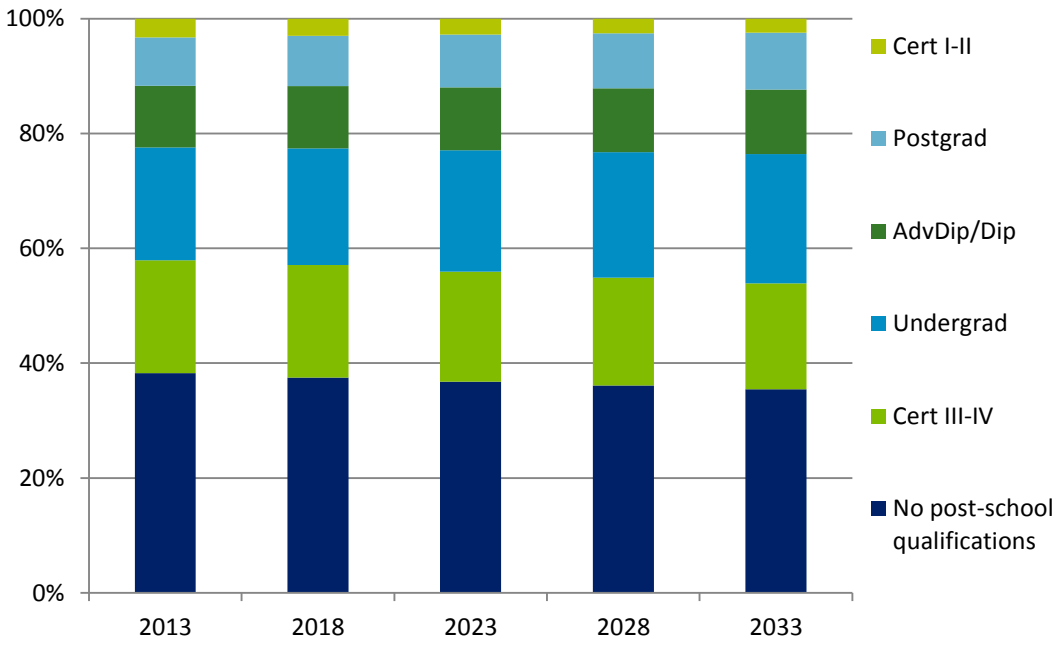
Table 4.8: Employed persons by highest level of qualification in the Illawarra region ('000)

Highest level qualification	2013	2018	2023	2028	2033
Postgraduate	10.8	11.6	12.5	13.1	13.7
Average growth in period		1.5%	1.4%	1.0%	0.8%
Undergraduate	25.3	27.0	28.6	29.9	31.0
Average growth in period		1.3%	1.2%	0.9%	0.7%
Advanced diploma / Diploma	14.0	14.6	15.2	15.6	15.9
Average growth in period		0.8%	0.8%	0.6%	0.4%
Certificate III and IV	25.8	26.1	26.3	26.3	26.2
Average growth in period		0.2%	0.2%	0.0%	0.0%
Certificate I and II	4.3	4.1	3.9	3.7	3.6
Average growth in period		-1.0%	-0.9%	-1.0%	-0.5%
Total with post school qualifications	80.2	83.4	86.5	88.7	90.4
Average growth in period		0.8%	0.7%	0.5%	0.4%
Total without post school qualifications	50.3	50.9	51.8	52.3	52.6
Average growth in period		0.2%	0.4%	0.2%	0.1%
Total employment	**130.5**	**134.3**	**138.3**	**141.0**	**143.0**
Average growth in period		**0.6%**	**0.6%**	**0.4%**	**0.3%**

Source: Deloitte Access Economics

Chart 4.6 provides a visual representation of the qualifications profile in the Illawarra region over the projection period. Note the gradual decline in the share of persons without a post school qualification (37.9% in 2013 to 36.7% in 2033), which is offset by growth in those employed holding a post-school qualification at the undergraduate and postgraduate levels.

Chart 4.6: Employed persons by highest level of qualification in the Illawarra region



Source: Deloitte Access Economics

The structural change expected in the Illawarra economy over the projection period can be seen in the changing 'qualification mix' of the workforce, as displayed in Table 4.8. Specifically:

- greater growth in the number of workers with a tertiary qualification (those at the postgraduate, undergraduate and advanced diploma levels);
- slower but still positive growth of qualifications at the certificate III-IV levels; and
- a declining number of workers whose highest level qualifications is at the certificate I-II level (in part because some of those workers are upskilling to higher level qualifications).

Overall, the propensity to hold a post-school qualification is expected to increase moderately over the forecast horizon, from 62.1% of the Illawarra workforce in 2013 to 63.2% by 2033.

Table 4.9 shows the number of workers in each broad occupation category with a post-school qualification from 2013 to 2033.

Table 4.9: Employed persons with post-school qualifications by broad occupation in the Illawarra region ('000)

Highest level qualification	2013	2018	2023	2028	2033
Managers	10.3	11.5	12.6	13.7	14.8
Average growth in period		2.3%	1.8%	1.6%	1.6%
Professionals	25.0	27.3	29.5	31.2	32.5
Average growth in period		1.8%	1.6%	1.1%	0.8%
Technical and trades workers	13.6	13.5	12.9	12.2	11.6
Average growth in period		-0.2%	-0.9%	-1.1%	-1.0%
Community and personal service workers	8.6	9.0	10.0	10.9	11.7
Average growth in period		1.0%	2.1%	1.7%	1.5%
Clerical and administrative workers	10.1	9.7	9.2	8.7	8.1
Average growth in period		-0.8%	-1.0%	-1.3%	-1.4%
Sales workers	4.7	4.6	4.5	4.4	4.3
Average growth in period		-0.6%	-0.3%	-0.4%	-0.5%
Machinery operators and drivers	3.9	3.7	3.8	3.8	3.8
Average growth in period		-0.9%	0.4%	0.1%	-0.2%
Labourers	4.1	4.0	3.9	3.8	3.7
Average growth in period		-0.1%	-0.6%	-0.5%	-0.5%
Total	**80.2**	**83.4**	**86.5**	**88.7**	**90.4**

Source: Deloitte Access Economics

As one might expect, those occupations that are projected to show the greatest levels of employment growth are also projected to show the greatest levels of qualification growth. Community and personal service workers exhibit the strongest qualification demand over the period, supported by a regional population that is projected to age at a faster rate than the national average.

Sales workers, clerical and administrative workers and labourers are all projected to show a decline in the level of qualifications, as the employment base shrinks over the projection period.

The tables above provide estimates of the stock of workers at any point in time who hold post-school qualifications. Estimates of the number of additional qualifications required over time need to take into account the fact that many workers hold more than one post-school qualification, and also that new entrants will require qualifications where they are replacing skilled workers who retire.

One can split out the demand for additional qualifications into five key driving factors:

- **Growth in the labour market**. Additional qualification needs which arise from the fact there are more workers required within the region.
- **Changing employment composition.** Different occupations have different qualification profiles. As the composition of employment changes towards higher skilled occupations, there is a demand for more qualifications, independent of changes in employment levels.
- **Retirements**. New entrants will be required to replace retirees (before accounting for any employment growth), and many of these new entrants will require qualifications.

- **Skills deepening.** Over time the propensity for workers to hold a post-school qualification, or to move to a higher level post-school qualification is rising.
- **Skills broadening.** This refers to the propensity of workers with a post-school qualification to gains additional qualifications at the same or lower level.

Hence, the following table outlines the projected additional qualifications required over time, broken down into the five different factors noted above. For a detailed description of the methodology employed in generating these projections refer to Appendix G.

Table 4.10: Sources of demand for required additional post-school qualifications in the Illawarra region

Additional qualifications required (relative to previous year)	2018	2023	2028	2033
due to increasing labour market size	749	1065	496	788
due to changing employment composition	559	475	383	356
due to retirement	2245	2378	2519	2612
due to skills deepening	288	324	366	447
due to skills broadening	92	104	117	152
Total additional qualifications required	**3933**	**4345**	**3881**	**4354**

Source: Deloitte Access Economics

Note that retirements are projected to make the greatest contribution to the additional demand for qualifications as 'baby boomers' leave the workforce at an increasing rate over time. In 2018, 57% of additional qualifications required are expected to arise from replacement of workers retiring. By 2033 this is still the dominant component at 60%.

The growing economy, represented in the above as growth in the size of the labour market, is also projected to add significantly to the additional demand for qualifications over the forecast period.

Changes to the composition of employment are projected to contribute to demand for qualifications, but more so in the short term, and less so as the Illawarra economy matures.

Individuals' propensities for skills deepening and broadening are projected to make a more modest contribution to skills demand in the short term, but this is expected to rise at a steady rate over time.

5 Infrastructure analysis

This chapter examines the infrastructure needs of the Illawarra region in terms of four key dimensions:

- Transport
- Utilities
- Education and health care
- Urban amenity/public domain

The purpose of this chapter is to provide an overview of the economic drivers for infrastructure over time and to highlight many of the major infrastructure projects that have been proposed for the region. Importantly, this chapter is not a detailed cost-benefit analysis for specific transport projects and governments should undertake such an analysis before pursuing any of the projects outlined here.

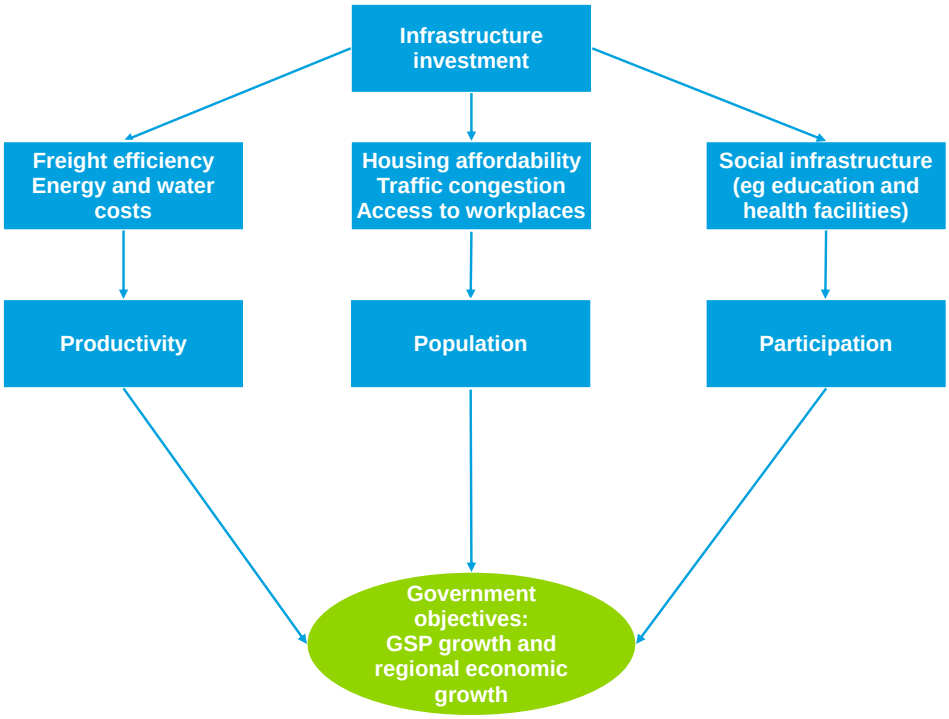
It should also be noted that a detailed study of just one infrastructure need in the region could constitute its own report. Thus the purpose of this chapter is not to provide a detailed assessment of all infrastructure requirements in the region, but rather to highlight how economic and industry drivers are likely to impact infrastructure demand in the region in the future.

5.1 Transport

Transport infrastructure plays an important role in improving accessibility in a region and connecting residents to employment, education and social opportunities. Transport can potentially play a role in enhancing the 'three Ps' of productivity, population and participation, which in turn drive economic growth. This relationship is shown in Figure 5.1 below.

For example, additional investments in the rail network can not only potentially increase the attractiveness of a region and support population growth, but can also increase workforce participation by making it easier for individuals to access employment. Reducing traffic congestion can similarly lead to increased freight productivity by reducing transport times, and might ultimately encourage new firms to relocate to a region, boosting local demand for goods and services.

Figure 5.1: The relationship of infrastructure investments to broader economic indicators



Source: Deloitte Access Economics.

5.1.2 Unique characteristics of the Illawarra region impacting transport

The unique geography of the Illawarra region poses important challenges for building transport links in the region, with the escarpment making it both difficult and costly to develop road and rail links to Sydney and the Southern Highlands. For example, the existing South Coast rail line meanders over the escarpment, increasing travel times. The need to tunnel through the escarpment has proved a barrier to extending rail freight links, for example, and has presented a significant engineering challenge for the proposed Maldon to Dombarton rail link. The geology of the region also imposes constraints on how roads are constructed, such as the need to include additional climbing lanes for heavy vehicles on Mount Ousley Road.

5.1.3 Existing transport infrastructure

The main north-south road link connecting Illawarra to Sydney is the M1 Princes Motorway (formerly referred to in parts as the F6) and Mount Ousley Road. Heavy vehicles travelling between Port Kembla and South West Sydney exit from the M1 at either Picton or Appin Road.

The only commuter rail link into the region is the South Coast-Illawarra line which connects to Sydney's City Rail network at Waterfall on Sydney's outskirts. The rail line is shared between both passenger and freight rail with priority given to passenger traffic. As a result, there is currently relatively limited capacity to increase freight rail on the coastal line. The

demands of peak passenger services also mean that trains often arrive at the port relatively bunched which impacts the efficiency of port operations.

The other major freight rail link is the Moss Vale to Unanderra line which allows freight from Port Kembla to be transported to and from the main North South rail line between Sydney and Melbourne. However, a major limitation of the Moss Vale to Unanderra line is that it is subject to speed and weight restrictions which increase the cost of using the line and the types of goods that can be transported on it (ACIL Tasman 2011).

Port Kembla is the major port in the region, with primary responsibility for car deliveries in NSW. The port also plays a significant role in transporting coal from the Western coalfields and other bulk cargoes. There is a small airport at Albion Park that can cater for light and small commercial aircraft.

While a detailed analysis of the Airport's future potential is beyond the scope of this project, the presence the Airport might provide the region with unique opportunities in coming years. For example, given the presence of Port Kembla and also the region's proximity to Sydney, it would be worth considering whether an expansion of freight might present realistic growth opportunities for the Airport. Similarly, the potential might exist for a broader use of the Airport, such as through the establishment of an aviation centre of excellence or avionics park.

5.1.4 Transport needs in the region: now and into the future

An analysis by the then Department of Transport and Regional Services (2007) of the Sydney to Wollongong corridor identified a number of specific issues with transport in the region including:

- the limited scope to increase rail freight on the coastal line due to priority being given to passenger trains;
- congestion on the road network between Heathcote and Blakehurst in Sydney;
- congestion between the Gwynneville interchange and the northern tip of Mount Ousley Road; and
- the expected impact of the expansion of Port Kembla on heavy vehicle numbers in the region.

The NSW Long Term Transport Master Plan (Transport for NSW 2012) also identified the need to:

- improve east-west transport links in the region;
- improve road capacity;
- strengthen bus operations in major centres;
- achieve rail station upgrades;
- improve rail travel times to Sydney; and
- provide transport links to new housing developments such as West Dapto.

A survey was conducted in 2012 to assess the infrastructure priorities of residents in the Illawarra. Respondents were asked to nominate their top three infrastructure priorities for the Illawarra region. The top ten transport infrastructure projects are shown in Table 5.1.

The results suggest that the most popular transport priorities for Illawarra residents are faster rail links to Sydney and the Albion Park Bypass as well as the completion of the F6 (M1 Princes Motorway) to Sydney. It is important to note that these were the priorities chosen by local residents rather than other stakeholders such as local businesses or public agencies in the region and was based on a relatively small sample so should not be regarded as a definitive indication of infrastructure priorities in the region.

Table 5.1: Transport infrastructure priorities of Illawarra residents

Transport infrastructure project	Proportion listing project in top 3 preferences
Faster rail link to Sydney	17.9%
Albion Park Bypass	10.5%
F6 extension to Sydney	9.3%
Princes Highway upgrade between Kiama and Nowra	7.6%
High speed rail link along the Eastern seaboard	7.6%
Maldon-Dombarton rail link completion	6.5%
Yallah Interchange, Princes and Illawarra Highways	4.5%
Picton Road Upgrade	4.1%
Port Kembla Expansion	3.3%
Mount Ousley Road Upgrade	3.1%

Source: RDA Illawarra Infrastructure Priorities Survey (2012).

In choosing which transport projects to prioritise in the region it is important to have an understanding of the longer term drivers of transport demand in the region. Three key drivers of future transport infrastructure demand are discussed below:

- accommodating the growth of Port Kembla;
- providing transport links to future housing estates in West Dapto and Calderwood; and
- accommodating population growth in the region and the growth of commuters over time.

Some potential projects that can assist in meeting these challenges are also discussed below with particular consideration given to projects which could potentially attract commuters to the region. A detailed list of potential transport infrastructure projects in the Illawarra region, and the findings of previous studies on them, is provided at the end of this section.

Accommodating the growth of Port Kembla

As noted in section 3.1, Port Kembla has provided the Illawarra region with a direct link to the growth in developing Asia, and will continue to do so in the coming decades. Up to now, the Port's growth has been predominately driven by burgeoning Asian demand for coal, and the current investment pipeline suggests that will continue in the near term.

Over the medium to longer term, it is likely that the composition of Port Kembla's trade flows will change, with opportunities existing in grain exports, containerised trade and automobile imports (see section 3.1). A change in the Port's trade mix will affect the

infrastructure requirements in the surrounding region, and ultimately might affect the economics of some of the projects considered below.

But regardless of the type of trade growth experienced over the coming decades, there can be little doubt that accommodating that growth will bring with it a range of infrastructure requirements. What follows is a brief discussion of infrastructure requirements that have been identified in the literature to date.

The expansion of the outer harbour at Port Kembla will result in growing road and rail freight over time. The Port has already commenced the first stage of reclamation works to build the outer harbour, although the reclamation project could take several decades to complete. It is not known how the transfer of the Port to private ownership is likely to impact the pace of the outer harbour expansion at this stage.

However, if the volume of trade through Port Kembla grows over time it will require improvements to both road and rail freight infrastructure to cope with increased freight movements.

In particular, the growth of Port Kembla will strengthen the case for the construction of the Maldon to Dombarton rail link. Construction of the link commenced in the 1980s but was left unfinished. The line would provide an alternative link to Sydney which would allow freight to avoid passenger traffic on the Illawarra line. However, a recent study by ACIL Tasman (2011) found that the benefits of the line did not exceed the costs at present. Transport for NSW is currently re-evaluating the case for the Maldon to Dombarton line, which is likely to depend significantly on the degree of growth in activity at Port Kembla. Further details on the Maldon to Dombarton rail link are provided in Box 5.1 below.

The Moss Vale to Unanderra rail line is relatively underutilised, in large part due to speed and weight restrictions. There is scope to loosen some of these restrictions by upgrading sections of the track at a cost of approximately $128 million (ACIL Tasman 2011). This may provide a potential interim solution to issues of freight capacity before the Maldon to Dombarton rail link is constructed.

Box 5.1: The Maldon to Dombarton rail link

Rail freight in the region is largely reliant on the South Coast-Illawarra rail line where freight is required to give priority to passenger trains. Another option for rail freight is the Moss Vale to Unanderra rail line. The proposed Maldon to Dombarton rail link which connects Port Kembla to the Southern Highlands potentially provides a quicker route to Sydney, and the planned intermodal terminal at Moorebank, than the Moss Vale to Unanderra line. Another advantage is that the line would reduce the need for rail freight to compete with passenger rail on the Illawarra line, potentially allowing for greater frequencies on that line.

The project would involve a four kilometre rail tunnel (one of the longest freight rail tunnels in Australia), a bridge over the Cordeaux and Nepean rivers, a crossing beneath the Hume Highway, three road overbridges and the installation of signalling systems and power supplies. Transport NSW is currently involved in evaluating the case for construction of the Maldon to Dombarton rail link.

Source: Transport for NSW (2013).

In the case of roads, capacity improvements are likely to be needed for Picton Road and Mount Ousley Road (INSW 2012). The case for the extension of the F6 (M1 Princes Motorway) to Sydney would also be strengthened by growth in freight traffic from Port Kembla.

In the case of Picton Road, the Picton Road Corridor Strategy (RTA 2011) indicated that there would be a need to add additional lanes to Picton progressively over the medium to longer term, namely beyond 2016. Meyrick and Associates (2008) found that the benefit-cost ratio for duplication of Picton Road was 5.4 with the project estimated to yield $574 million in net present value terms.

The need to provide additional climbing lanes for heavy vehicles on Mount Ousley Road has also been identified, and funding has been provided under the second stage of the Nation Building Program based on joint State and Commonwealth Government funding.

Providing transport links to future housing estates

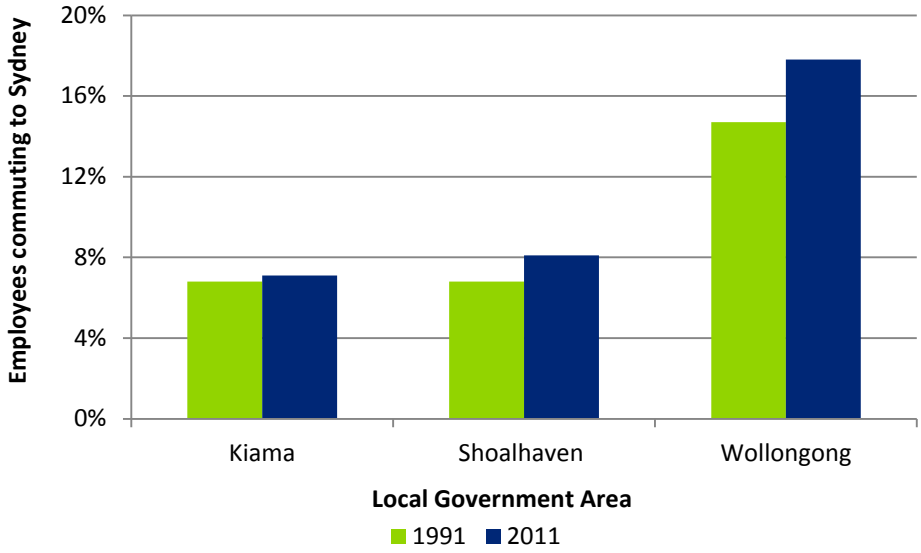
Areas such as West Dapto, Calderwood and Tallawarra are likely to be the main focus of new housing release estates in the coming years (Department of Planning and Infrastructure 2013). An important challenge for the region will be to provide frequent bus services to new release estates which link them to major employment centres and rail stations.

Providing additional access ramps to the M1 motorway to facilitate better access to new release areas has also been identified as a potential way of improving the accessibility of new release sites. The proposed F6 Albion Park Bypass between Yallah and Oak Flats would also help to improve accessibility within the region.

Growth of commuter population

As shown in Chart 5.1, the commuter population in the Illawarra's three LGAs has grown progressively over time. The largest increase has been evident in the Wollongong LGA, with the proportion of residents commuting to Sydney rising from 14.7% to 17.8% from 1991 to 2011.

Chart 5.1: Proportion of employees commuting to Sydney over time



Source: ABS 2011 Census, IRIS (1999).

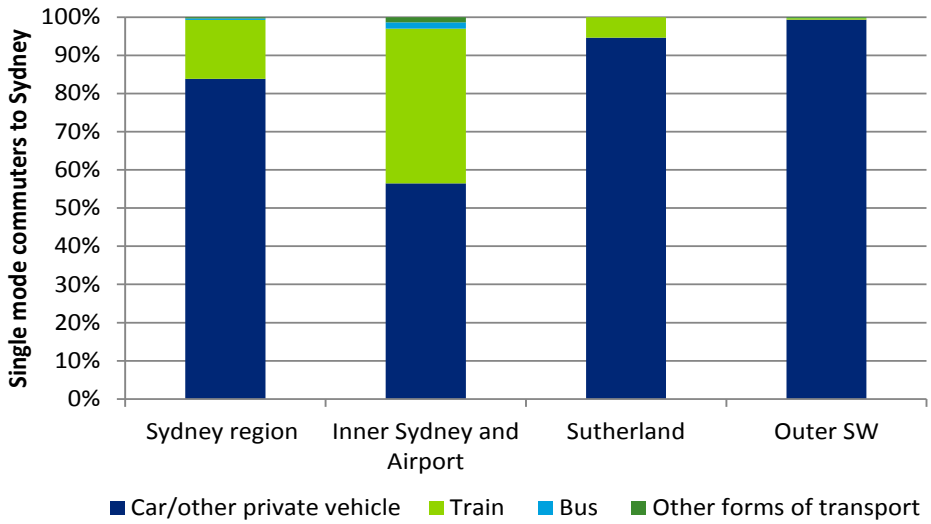
The commuter population in the region is likely to continue to grow progressively over time, both as a continuation of current trends and as telework arrangements become more commonplace. This is likely to have implications for the demand for transport infrastructure in the region. In particular, it is likely to progressively increase patronage of the coastal rail line to Sydney and roads used to access Sydney including the M1 and Picton and Appin roads for those travelling to the South West of Sydney.

Chart 5.2 shows the travel model taken by commuters to Sydney who rely on a single mode of transport. Among those commuting to Sydney from the Illawarra, 84% travel by car or other private vehicle, 15% by train, and the remainder (less than 1%) by bus and other forms of transport. The three columns to the right show the travel mode of single mode commuters to the three SA4 regions in Sydney that account for the largest number of commuters from the Illawarra: Inner Sydney and the Airport, Sutherland, and the Outer South West (including Campbelltown). These regions collectively account for 74% of all single mode commutes to Sydney.

There are significant differences in the travel mode chosen for the Inner Sydney region relative to other major commuting regions in Sydney. In total, over 40% of single mode commutes to the Inner Sydney region are by train, while only 5.4% of commutes to the Sutherland region are by train and less than 1% to the Outer South West. Rail commuting is also largely concentrated in the Wollongong LGA, with 90% of those travelling by train at some stage in their commute residing in the Wollongong LGA.

Overall, once those using multiple transport modes are included, 82% of commutes to Sydney involve driving by car at some stage, while 23% involve travel by train at some stage of the journey. Only 2% of commutes to Sydney involve catching a bus at some stage. While 24% of commuters from Wollongong catch the train at some stage in their commute to Sydney, only around 15% of those residing in the Shellharbour and Kiama LGAs catch the train as part of their commute to Sydney.

Chart 5.2: Travel mode of single mode commuters to Sydney



Note: Excludes those who usually commute to Sydney but did not go to work on the Census date, worked at home or did not state their travel mode.
Source: 2011 Census.

These commuter patterns and the progressive growth of commuter numbers over time imply that demand for road routes to Sydney are likely to grow over time. Similarly, train travel is likely to remain important, particularly for those travelling to the Inner Sydney and Airport region.

Infrastructure to grow commuters in the region

While the commuter population has grown relatively slowly over the last three decades, large infrastructure projects also have the potential to substantially increase the region's commuter population in coming years. Infrastructure investments that could help achieve this include faster commuter rail travel to Sydney, the extension of the F6 (now M1 motorway) from Waterfall to Alexandria, and to a lesser degree improvements to Mount Ousley and Picton Road.

The State Infrastructure Strategy takes the view that improvements to commuter rail travel time could be achieved by focusing on speed restrictions, pinch points and removal of intermediate stops. Travel times could also be improved by more expensive capital works options such as the creation of a tunnel between Waterfall and Thirroul. However, this option is relatively expensive and was costed at $1.4 billion in 2003, although partial realignments could be achieved at lower cost (Connell Wagner 2003). This cost estimate is relatively old and it is unclear what the potential options are to improve the rail corridor

(including the extent of potential benefits from a redirection of freight rail to Maldon to Dombarton).

These considerations highlight the need for a more detailed study into the various potential options to improve the South Coast rail line, which was the single highest priority in the RDA Illawarra Infrastructure Priorities Survey. It is also important that potential funding mechanisms for improvements to the coastal rail line, in addition to government funding be considered. This could include exploring value capture options for residential and commercial developments along the rail line, which also enhance transport accessibility in the region.

Another improvement that could substantially improve commuting times to Sydney would be the extension of the F6 from Alexandria to Waterfall to link up with Sydney's orbital network. This would significantly improve travelling times to the airport, CBD and Sydney's northern suburbs from the Illawarra and Sydney's southern suburbs. The extension would involve a relatively substantial investment, costed at $3 billion in the Infrastructure New South Wales State Infrastructure Strategy (2012).

5.1.5 Listing transport infrastructure priorities for the region

A high-level list of some of the major transport infrastructure projects in the region is shown in Table 5.2. The list does not seek to comprehensively cover all potential transport projects in the region, but rather provide an overview of some of the main projects which have been considered in the past and the key findings of previous studies on them. The projects are structured around six areas:

- improvements to commuter rail;
- improvements to freight rail;
- improvements to regional rail;
- an extension of the F6 (M1 motorway) north to Sydney;
- an expansion of Albion Park Airport; and
- an expansion of Port Kembla.

In addition to investments to bring more commuters to Sydney discussed above, a series of smaller investments that could potentially play a role in improving accessibility within the region are included in Table 5.2. The list focuses on larger capital works rather than operational improvements, although operational improvements such as more regular bus services in the region are also critical to improving accessibility in the region as highlighted in the Long Term Transport Master Plan (Transport for NSW 2012).

Table 5.2: List of potential infrastructure projects in the Illawarra

Category	Details	Findings of previous studies
Improvements to commuter rail travel time on the South Coast rail line	Travel between Wollongong and Central station currently takes at least 90 minutes (85 under the new timetable) and involves long waits on some parts of the journey. A longer term option would be to connect Wollongong to a high speed rail line along the Eastern seaboard, although geotechnical issues mean it may be difficult for this to occur.	Connel Wagner (2003) estimated that a tunnel between Thirroul and Waterfall would cost $1.4 billion, although partial realignments could be completed for $600 – $779 million. The SIS suggests that improvements to travel time could be made focusing on speed restrictions, pinch points and removing intermediate stops alongside minor capital works. The construction of the Maldon to Dombarton rail line is likely to reduce freight traffic on the line but is likely to have a more limited impact on travel time.
Freight rail capacity	Completion of the Maldon to Dombarton rail link would reduce the need for freight to compete with passenger trains on the coastal Illawarra line. Additional capacity exists on the Moss Vale – Unanderra line but growth is limited by speed and weight restrictions.	The cost of completing the Maldon to Dombarton rail link was estimated to be $624 to $667 million (ACIL Tasman 2011). The SIS suggests this could be completed in years 10-20 with possible private sector involvement. The ARTC has indicated that improvements to the Moss Vale – Unanderra line be completed costing around $125 million (ACIL Tasman 2011).
Improving regional roads	A number of potential projects exist including *inter alia*: • Additional climbing lanes on Mt Ousley Rd between Picton Rd and Bulli Tops, improvements to junction with the F6 • F6 and Masters Rd interchange • Duplication of Picton Rd between Mt Ousley Rd and the Hume Highway • F6 extension from Yallah to Oak Flats ('Albion Park Bypass') • F6 widening between Wollongong and Dapto • F6 access ramps to West Dapto housing release areas	Funding has been committed for climbing lanes on Mount Ousley Rd jointly by the State and Federal governments, the later as part of the Nation Building Program. A study of Picton Road duplication found that it had a benefit-cost ratio of 5.4 and could be completed at a cost of $135 million (Meyrick and Associates, 2008). The NSW government allocated $1 million to progress planning on the bypass between Yallah and Oak flats but has not yet committed to the project. RDA Illawarra (2012) notes the cost of this project is potentially around $400 million.
Extension of the F6 (M1 motorway)	Extension of F6 from Waterfall to Alexandria. This may involve a tunnel along some sections of the corridor.	The Allen Consulting Group (2007) undertook a study of the route which estimated a cost of $2.3 billion. The benefit-cost ratio ranged from 0.46 to 0.82, however the project was estimated to lead to a sustained increase in GSP of just under $3 billion. The SIS assumes $3 billion in construction costs will be required for the project and is based on 2/3 of funds being sourced from private sources.
Albion Park Airport Expansion	Upgrade the Illawarra Airport from 2C to 3C to accommodate small jets such as the Embraer 170/190.	RDA Illawarra's Infrastructure Priorities Survey indicates the cost of the upgrade is estimated at $90 million to $130 million depending on the configuration (RDA Illawarra 2012).
Port Kembla expansion	Development of the Outer Harbour to provide additional land and berthing facilities.	Stage 1A reclamation works have commenced which will provide an additional 6.9 hectares of port land. The Outer Harbour development will involve three discrete stages to 2037 and is expected to cost approximately $700 million (NSW Auditor-General 2011).

Source: SIS, ACIL Tasman (2011), Connel Wagner (2003).

RDA Illawarra and local councils should look to work with Infrastructure NSW to prioritise these projects and co-ordinate their delivery. Prioritisation should be based on the highest benefit-cost ratio. As many of these projects have not been subject to a cost-benefit analysis, RDA Illawarra and local councils will need to work with Infrastructure NSW to ensure this occurs.

5.2 Utilities infrastructure

Utilities infrastructure, namely water, electricity, gas, waste and telecommunications, plays an important role in supporting new residential developments, industrial estates and office buildings in the region.

5.2.1 Unique characteristics of the Illawarra region and existing utility infrastructure

Water supply in the Illawarra is primarily supplied by the Avon Dam, although Helensburgh sources its water from Woronora Dam (NSW Department of Planning 2007). The western parts of the Wollongong LGA comprise parts of the Upper Nepean and Woronora catchments, with much of the area classified as a Metropolitan Special Area. The West Dapto new release area sits within the catchment of Lake Illawarra (NSW Department of Planning 2007).

The Illawarra region has significant electricity needs as a result of its dependence on heavy manufacturing including steelworks and mining. However, the relative importance of the manufacturing sector in the region has progressively declined in recent decades, which is likely to result in reduced demand for electricity and natural gas over time.

The major landfill space in the Wollongong LGA is at Whytes Gully in Kembla Grange. The current site is predicted to reach capacity in 2014 with the Department of Planning and Infrastructure recently granting approval to extend the landfill to an adjacent site. Waste and recycling depots for the Shellharbour and Kiama LGAs are located at Minnamurra and Dunmore respectively.

In terms of telecommunications infrastructure, the Kiama LGA was one of the first areas in Australia to receive the national broadband network. Construction of the NBN has also commenced in Wollongong, Dapto and some of the northern suburbs of Wollongong such as Bellambi and Corrimal. A Tier III data centre has also been constructed in Unanderra which will be operated by Metronode with the NSW Government as its main client (Metronode 2013). This is an important opportunity for the region and RDA Illawarra and local councils should look to co-ordinate with the NSW Government to explore any opportunities for the data centre facilities to be opened up to private sector clients over the next five years.

5.2.2 Utility needs in the region into the future

There are two main drivers that are likely to impact infrastructure needs in the Illawarra into the future:

- the utility infrastructure requirements of new housing release areas; and
- the impact of climate change.

The impact of both these factors is discussed in detail below.

New housing release areas

As the new housing release areas in West Dapto, Tallawarra and Calderwood are progressively developed, there will be a need for basic utilities infrastructure such as energy and water, in addition to transport and communications infrastructure. The Illawarra Regional Growth Plan Discussion Paper (NSW Department of Planning 2013) notes that Endeavour Energy has obtained a site in West Dapto for a new sub-station to accommodate future developments and Sydney Water Corporation's Growth Servicing Plan 2011-16 has incorporated short-term infrastructure works to service West Dapto. A further challenge for the new housing release areas will be to minimise the potential for urban runoff into Lake Illawarra.

Climate change

The region's water table is likely to be impacted by climate change over time with the potential for an increased risk of flooding in the region, particularly around Lake Illawarra.

To respond to some of the challenges of climate change, RDA Illawarra has focused on providing sustainable development opportunities in the region through the 'Green Jobs Illawarra' project which seeks to apply green technologies in the manufacturing, renewable energy and construction sectors. In particular, the Clean Tech Illawarra project seeks to support regional manufacturing and engineering businesses to pursue new business opportunities in the clean energy market. These sorts of initiatives will help improve the resilience of firms in the region to the longer term impacts of climate change and potentially create new markets for firms.

The role of broadband infrastructure in regional development

Another key piece of utilities infrastructure that the region will need in the future if it is to continue to focus on innovation and attract business investment is broadband infrastructure. As noted above, the NBN has already been delivered in Kiama and is under construction in parts of Wollongong. Ensuring that the region has access to high speed broadband and ensuring that it is provided to new housing estates is likely to assist in attracting businesses to the region. It would also assist in promoting telecommuting and the delivery of online health services to the region's ageing population.

A critical proposal to foster innovation in the region is the iAccelerate project, which aims to build a 3,500 square meter purpose built high tech building connected to the NBN that will accommodate 25 emerging high tech businesses to develop a high-tech industry cluster. This project was included as part of the Restart Illawarra funding shortlist.

5.3 Health and social services/education

Health, social services and education are key components of what is often referred to as 'soft' infrastructure. These components are critical to supporting the welfare of the Illawarra community as well as supporting economic development and the growth of human capital in the region.

5.3.1 Existing social infrastructure

Healthcare in the region is provided by a number of public and private hospitals. Public hospitals are located at Bulli, Coledale, Kiama, Port Kembla, Shellharbour and Wollongong, while private hospitals are located at Figtree, Shellharbour and Thirroul (RDA Illawarra Regional Plan 2010). The region also has significant primary and allied health care services. Community Health Centres are located in Dapto, Helensburgh, Wollongong and Warilla (NSW Health 2012).

Wollongong is the largest hospital in the region and treats more than 47,000 patients annually. The hospital has total forecast expenses of $313.2 million in 2013-14 which equates to around 42% of the total for the Illawarra and Shoalhaven Local Health District (ISLHD 2013). Wollongong Hospital is the major principal referral hospital in the region and also the location of the Illawarra Regional Cancer Centre. Emergency units are located at both Wollongong Hospital and Shellharbour Hospital.

Illawarra's education sector is dominated by the University of Wollongong. The University accounts for some 5% of the Wollongong economy and in 2012 had a total enrolment 29,000 students, including a large population of international students who account for around 40% of the student population (University of Wollongong 2013). [5]

TAFE Illawarra has a number of campuses in the region with the largest being the Wollongong campus. Other campuses exist at Wollongong West, Yallah, Shellharbour and Dapto. The TAFE Illawarra system caters for approximately 34,000 students in 14 campuses across the South Coast and Southern Highlands. As noted in Appendix B, the proportion of residents in the region with vocational qualifications is relatively high, given the region's focus on manufacturing.

5.3.2 Social infrastructure needs in the region: now and into the future

Health and aged care

Deloitte Access Economics' population projections indicate that as of June 2013, 16.8% of the Illawarra region was aged 65 and over, compared to 15.4% of NSW as a whole. This proportion is projected to grow to 23.5% for the Illawarra by June 2033 compared to 20.3% for NSW as a whole. These figures imply that not only does the Illawarra region have a

[5] This figure represents total enrolments. The UOW has campuses throughout the South Coast region, two in Sydney, as well as one in Dubai. The available data do not show enrolments by campus.

higher proportion of older residents than NSW as a whole, but that the proportion of Illawarra residents 65 and over is projected to grow strongly over time.

This population profile implies that the demand for health services in the region will grow substantially. A recent population health profile for the Illawarra/Shoalhaven found that the Shellharbour region currently only had 60.6 aged care places per 1,000 people over 70, which was well below the state average of 87.5 places per 1,000 people (Illawarra-Shoalhaven Medicare Local 2013).

This highlights the need to expand the availability of aged care beds in the region, particularly as the population ages over time. A number of aged care projects in the region were recently shortlisted for funding under the Restart Illawarra program:

- Bulli Hospital – Centre for Excellence for Aged Care;
- Warrigal Care – construction of a 120 bed aged care facility in Wollongong;
- Care and community centre for aged residents with intellectual disabilities in Kanahooka;
- Warrigal Care – construction of a 100-bed aged care facility, Shell Cove; and
- Kiama Hospital site – integrated aged and health care services.

The inclusion of five aged care related projects out of a total of 13 for the region highlights the need for additional aged care services in the region, a need which is likely to grow into the future.

Many of the region's hospitals are also currently experiencing relatively high levels of overall demand. Bed occupancy rates for the Illawarra-Shoalhaven Local Health District averaged 92.8% in the year to June 2012, compared to 88.6% for NSW as a whole (NSW Health 2012). This is an improvement on previous years (the figure for 2010-11 was 97%) but still suggests a relative shortage of hospital beds compared to other health districts in NSW (NSW Health 2012). By comparison, the bed occupancy rate for private hospitals in the region was 82% which was well below the State average. While bed occupancy rates for individual hospitals have not been publicly available in recent years, bed occupancy rates were equal to 95% or higher for Wollongong, Shellharbour and Bulli hospital in 2007-08 but 86.6% at Coledale Hospital (South East Sydney Illawarra Area Health Services 2008).

The NSW Bureau of Health Information report card for Wollongong Hospital for the June quarter 2013 finds that on the whole Wollongong Hospital was better able to meet elective surgery waiting time benchmarks than its peer group, reflecting a significant improvement on the same period last year. However, there are a couple of areas where waiting times were noticeably larger than its peer group including ear, nose and throat surgery and hip and knee replacements.

In terms of emergency treatment, while waiting times for emergency scenarios (Triage 2) were similar to the NSW average, waiting times for urgent, semi-urgent and non-urgent were on the whole higher than the state average both in the June quarter 2013. They had, however improved since the same period last year. In total 53% of patients were seen within four hours, which was an improvement on the June quarter 2012 but below the NSW target of 71%.

A particular concern at Wollongong Hospital has been the lack of parking with a NSW Health Patient survey in 2010 finding that 55% of patients rated parking at the site as poor compared to the state average of 36%, with absence of parking being rated the lowest attribute for the hospital in the survey. The hospital is seeking to address this issue with a development proposal for new car park facilities at the Hospital having been recently submitted to Wollongong City Council.

A recent population profile by the Illawarra-Shoalhaven Medicare Local (2013) has also identified the need for more after-hours services with utilisation of after-hours GP services in the region being below the state average. However, the study did find that the number of young GPs has grown in recent years as a result of the University of Wollongong's expansion into doctor education (Illawarra Mercury 2013). Within the region, Shellharbour in particular has high rates of avoidable mortality for cancer and death from cardiovascular causes (Illawarra-Shoalhaven Medicare Local 2013).

In the longer term, an ageing population will increase the demand for health care in the region, particularly for Wollongong Hospital. However, there is limited scope for the hospital to expand on its existing site. The limited scope of the hospital to expand highlights the need to explore the potential for establishing a new hospital in the region over the longer term. More broadly access to allied health continues to be of concern in the region, with demand likely to grow as the population ages. RDA Illawarra should undertake a review of existing assessments of the Illawarra's health needs both now and into the future, including how they can be best co-ordinated with the provision of aged care facilities.

Education

The provision of new housing release areas in West Dapto, Calderwood and Tallawarra will lead to a need for more schools near new housing release areas. The Illawarra Growth Plan Discussion Paper (2013) notes that the NSW Department of Education and Communities has identified that 11 new primary and three new high schools will be needed to accommodate demand from the new housing developments and is exploring potential sites in West Dapto. However, in aggregate the school age population in the region is expected to remain relatively stable over the period to 2033 as a consequence of declining fertility rates and an ageing population. Thus there is unlikely to be a substantial increase in overall demand for primary and secondary educational infrastructure in the region.

By contrast, the demand for tertiary education infrastructure is expected to grow. The demand for university education will be driven by both domestic and international enrolments. First, domestic enrolment growth is likely to continue as more young people enter university and the Commonwealth Government seeks to meet its target for 40% of those aged 25-34 to have a university degree by 2020. The progressive shift away from manufacturing towards more service orientated industries such as health care in the region is also likely to lead to an increase in demand for university education from Illawarra residents over time.

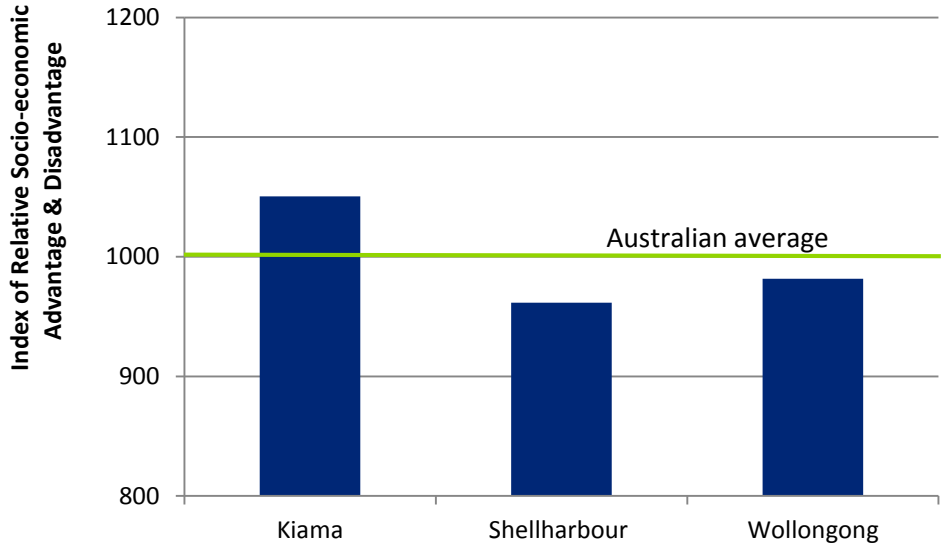
Secondly, international demand for education is likely to grow strongly. As noted in Chapter 3, international enrolment growth at the University of Wollongong has averaged 9% a year since 2001 and demand is likely to continue to grow as a result of the emergence of the Asian middle class. This will lead to a need to expand the university over time. The

expected growth of the health care sector in the region is also likely to result in increased demand for health care education for nurses and doctors at the university.

Social services

Wollongong and Shellharbour both have higher levels of socio-economic disadvantage than the Australian average. Chart 5.3 shows the SEIFA Index of Relative Socio-economic Advantage and Disadvantage for the three LGAs in the Illawarra along with the Australian average. The index is constructed so that the Australian average is 1000. Shellharbour and Wollongong have an index below 1000 which indicates that they have higher levels of socio-economic disadvantage than the State average. Overall, the weighted population average for the Illawarra was 982, which is below the national average.

Chart 5.3: SEIFA Index of Relative Socio-economic Advantage and Disadvantage



Source ABS 2011 Census.

The level of socio-economic disadvantage in the region is partly a reflection of the region's persistently higher unemployment rates (see Chart B.5 in Appendix B). As a result, the population of the region is likely to have a higher demand for social services than the State average. This is borne out in a number of indicators. For example, rates of high or very high psychological distress in the Illawarra Shoalhaven local health district were the third highest across all local health districts in NSW. The prevalence of high or very high psychological distress in the region was 12%, compared to the NSW average of 10.4% (Drabsch 2012).

Homelessness in the region also increased by 84.8% in Wollongong from the 2006 to 2011 Census and by 80.4% in the Kiama and Shellharbour area (Illawarra-Shoalhaven Medicare Local), which highlights the demand for social housing infrastructure in the region. At the 2011 Census 813 homeless people were counted in Wollongong and 166 in Kiama and Shellharbour. There is also evidence that the region, as with other regions in NSW, is facing significant unmet demand for child care places (ABC 2011).

5.4 Urban amenity/public domain

Urban amenity is an important aspect of the liveability of urban areas. Urban amenity can potentially be improved by actions such as providing recreational areas, improving access to the waterfront, updating town squares or changing zoning regulations to allow former industrial areas to be released for residential development.

The economic literature has found that improvements to urban amenity can play a role in attracting more people to an area. For example, the literature has shown that an increase in the number of restaurants has a positive impact on population growth in a region (Glaesar et al 2001, Carlino and Saiz 2008). Similarly, an increase the number of live music venues is also associated with an increase in population (Glaesar et al 2001). However, other venues such as art museums, movie theatres and bowling alleys have all been associated with decreases in population growth (Glaesar et al 2001, Carlino and Saiz 2008). Similarly, areas with high levels of public amenity are likely to attract greater tourist numbers to a region with a 1% increase in tourism employment growth associated with a 0.027-0.033% increase in the population (Carlino and Saiz 2008).

5.4.1 Public domain needs in the region: now and into the future

Wollongong City Centre has been identified as an area that benefit from a major revitalisation program by Wollongong City Council under the CBD Action Plan. Presently, $5 million was provided to the revitalisation program from the Regional Australia Development Fund for the upgrade of Crown Street Mall with Wollongong City Council to contribute a further $10 million. A number of other projects are also proposed to revitalise the area as part of the Wollongong CBD Action Plan:

- a Business and Investment Attraction Program;
- streetscape upgrades in Keira and Crown Streets;
- streetscape upgrades in Burelli Street and the redevelopment of MacCabe Park;
- streetscape upgrades in Crown Street-East;
- upgrade of Civic Plaza and its edges;
- encouraging quality building outcomes for key development sites in and around the CBD;
- traffic improvements in and around the CBD;
- restoration of the Bathers Pavilion Precinct; and
- develop a vision for Wollongong-South.

The CBD action plan involves a range of short, medium and long term actions. Part of this involves increasing residential densities around the railway station and in the city centre. These sorts of developments will play an important role in both improving perceptions of the Wollongong City Centre as a public space but also improving accessibility to the city centre and complementing other activities being undertaken by the private sector such as GPT's redevelopment of the Wollongong Shopping Centre, which is scheduled to be completed in 2014.

A convention centre has also been mooted for Wollongong, which could potentially help bring greater tourist numbers to the region.

Outside Wollongong, the Shell Cove Development is a major long term development opportunity which will see the development of a 300 berth marina within an in-shore boat harbour, a golf course, community parks and playgrounds and commercial, community and recreational facilities. While this will lift the urban amenity of the area, the development has been controversial in part due to environmental concerns about the impact on surrounding wetlands (RDA Illawarra 2012).

That said, there are untapped and potentially large scale economic and social benefits that can logically be derived from the construction and completion of the Shell Cove Development. While further studies and research would need to be undertaken to quantify these benefits, it is recognised that the Shell Cove Development has the potential to convey considerable benefits to the region across multiple industry sectors.

Improvements to public spaces and urban amenity could also play a role in supporting residential and commercial developments in many of the northern coastal suburbs of Wollongong, particularly areas around major rail stations.

In the future, as new housing release areas are developed in West Dapto there will also be a need to ensure adequate community spaces and recreational areas are provided to local residents in these communities.

6 Supply chain analysis

The supply chain analysis seeks to examine the supply chain linkages of two emerging or developing industries in the Illawarra. The chapter first discusses how the industries under examination were selected; before proceeding to discuss current trends for the selected industries, future demand, their supply chains and the occupational profile of their labour force.

6.1 Choosing an industry

In order to assess which industries should be analysed, this section of the report examines how industries compare across five key factors:

- forecast future growth;
- recent growth in the Illawarra (last five years);
- existing comparative advantage;
- export potential; and
- the potential for growing human capital in the region.

Collectively, these factors are likely to identify industries with significant growth potential in the region and which are likely to have important flow-on benefits for regional development. The following subsections discuss how the 19 ANZSIC industries compare across these five factors.

6.1.1 Forecast future growth

A critical factor in identifying emerging or developing industries in the Illawarra is identifying those that are likely to grow over time.

Health care and social assistance, education and professional services are expected to be the fastest growing industries in the Illawarra over the next two decades in absolute terms (see Table 4.3).

Top 5 industries based on forecast growth: *health care and social assistance, education, professional services, transport and finance*.

6.1.2 Recent growth

Table 6.1: Growth of employment, 2006 to 2011 Census, by industry

	% Change (5 Years)	Absolute Change
Agriculture	-5.53%	-21
Mining	51.32%	602
Manufacturing	-16.90%	-1,884
Utilities	14.09%	114
Construction	-0.55%	-31
Wholesale	-0.28%	-6
Retail	-3.58%	-397
Hospitality	15.95%	1,048
Transport	7.62%	267
Information media	-17.83%	-209
Finance & insurance	12.60%	380
Rental & real estate	-6.35%	-106
Professional services	7.14%	310
Admin & support	9.56%	222
Public admin	13.24%	685
Education	13.95%	1,278
Health care and social assistance	25.33%	2,805
Arts & recreation	2.71%	32
Other services	9.73%	348

Source: 2011 Census

Between the 2006 to 2011 Census, we note that:

- In terms of relative growth, mining, health care and social assistance, hospitality, utilities, education and public administration are the top growing sectors in the Illawarra region.
- In absolute terms, health care and social assistance, education, hospitality, public administration and mining have expanded the most.
- Taken together this implies that health care and social assistance, education, hospitality, mining and public administration are the top performing sectors in the Illawarra region in the recent 5 years.

Based on this metric and assuming the relative demand for labour in these sectors remains unchanged, we would expect firms in the health care and social assistance, hospitality and education sectors to experience significant growth going forward.

This lends support to the argument that aged care services could be a key sector for the Illawarra, particularly given its ageing demographic profile. Education is also expected to grow, driven both by an ageing population (see section 3.2) and by rapid growth in middle income Asia (see section 3.1). Growth in the education sector would be expected to ultimately result in more graduates, which in turn should stimulate professional services.

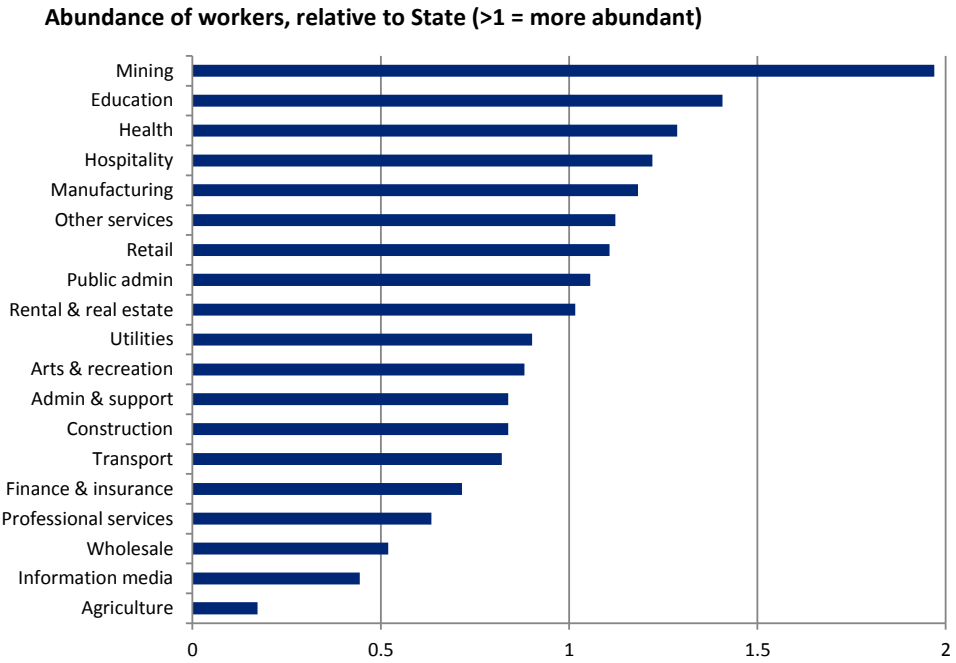
Finally, we note that hospitality is growing which suggests tourism could also be a key sector for the Illawarra region.

> Top 5 industries based on recent growth: *health care and social assistance, education, hospitality, mining and public administration*

6.1.3 Comparative advantage

Chart 6.1 shows the industries which are in relative abundance in the Illawarra region. A value of 1 implies that a particular industry makes up the same share of the Illawarra's workforce as it does for the NSW workforce. A value greater than 1 implies the Illawarra's workforce is over-represented in that particular industry compared to NSW as a whole, and vice versa. The standout is mining, although the region is also significantly over-represented in education, health, hospitality and manufacturing.

Chart 6.1: Industry intensity

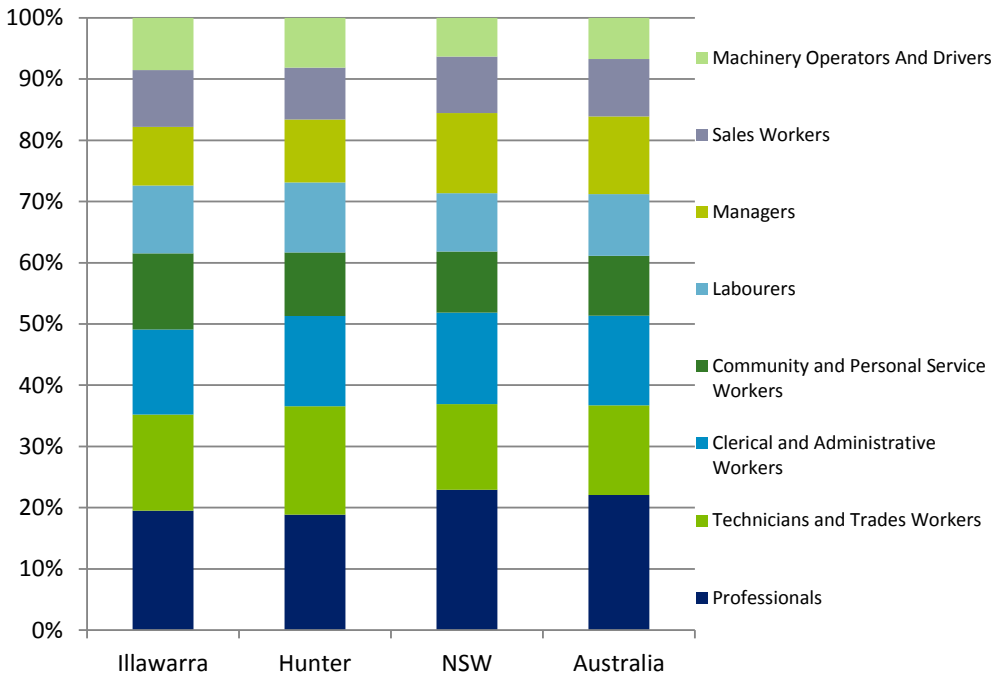


Source: 2011 Census

Consistent with its strength in these sectors, the region has a relatively strong supply of workers who are machinery operators and drivers (consistent with its role as a major manufacturing centre), community and personal service workers (given the large proportion of health and hospitality workers) and technicians and trades workers (who support both mining and manufacturing).

On the whole, the region has a relatively small proportion of managers and professionals, which is consistent with its under-representation in both the finance and professional services sectors.

Chart 6.2: Selected proportion of occupations



Source: ABS Labour Force Survey

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force Survey should be interpreted with caution due to small sample sizes.

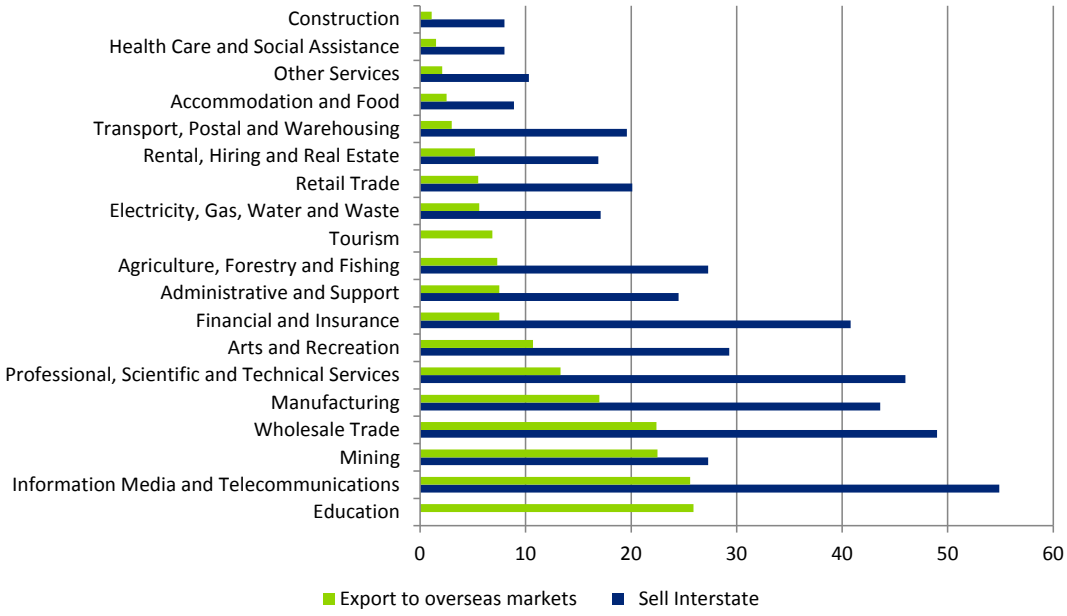
Top 5 industries in terms of comparative advantage: *mining, education, health, hospitality and manufacturing*

6.1.4 Export potential

The export potential of industries is important since it increases the extent to which Illawarra businesses (and thus residents) can benefit from economic growth outside of the region. Chart 6.3 shows the percentage of Australian businesses that export to interstate and overseas markets in each industry. The top five industries in terms of export potential are: information media and telecommunications, mining, wholesale trade, manufacturing and professional services.

It must be noted that the Chart does not fully capture all export activities. For instance, interstate or foreign tourists using and paying for local hotels will not be captured in the statistics for Accommodation and Food.

Chart 6.3: Export potential by industry



Note: No information is available for the public administration sector, although for ranking purposes it is assumed that the level of overseas exports from this sector is relatively small.

Source: ABS 8167; Department of industry, Innovation, Science, Research and Tertiary Education

For the education sector the export potential of the sector is by and large determined by the higher education sector. No information was provided on the education sector in the ABS publication used in the chart above, so instead the proportion of international students to total enrolments was used as a key metric to measure export potential. In 2012, the higher education sector had 325,961 international students and 931,761 domestic students. This implies that the export to overseas market is around 25.9%.

Because tourism covers a number of industries, to determine the export potential of this "sector" we measure total international visitor expenditure to the gross output of the industry. According to the ABS, total international visitor consumption in 2009-10 was around $22.68 billion. However, we compare this to the gross output of the industries affected by tourism, which include:

- Accommodation
- Ownership of dwellings
- Cafes, restaurants and takeaway food services
- Clubs, pubs, taverns and bars
- Rail transport
- Taxi transport
- Other road transport
- Air, water and other transport
- Motor vehicle hiring
- Travel agency and tour operator services

- Cultural services
- Casinos and other gambling services; and
- Recreation services

We find that the tourism industry in 2009-10 was worth around $331.10 billion. This implies that the export potential is around 6.9%.

> Top 5 industries in terms of export potential: *Education, information media and telecommunications, mining, wholesale trade, manufacturing and professional services*

6.1.5 The potential to grow human capital in the region

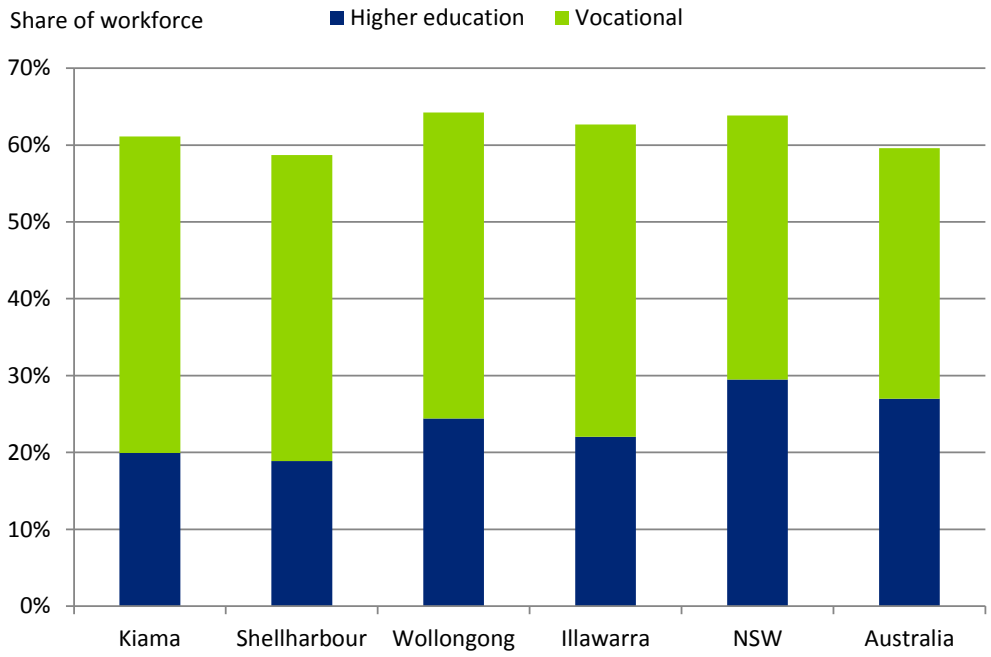
Research by the Department of Employment, Education and Workplace Relations (2012) on the Illawarra Priority Employment Area (which includes the four LGAs of Shellharbour, Wollongong, Shoalhaven and Eurobodalla) has highlighted the importance of growing human capital in the region.

This is reinforced by the fact that across the LGAs that make up the Illawarra between 55% and 69% of those aged 25 to 34 have completed year 12, which is below the State average of 75%. It also illustrates the degree of disparity within the region, with the 69% figure being for the Wollongong LGA compared to 55% for Shellharbour.

Similarly, 13% of year 9 students in the Shellharbour region did not meet the minimum standard for reading compared to the NSW average of 6%. For numeracy, the equivalent figure was 9% compared to 6% for NSW.

Chart 6.4 shows the proportion of the workforce with post-school qualifications in the region. The proportion of the workforce with university qualifications is relatively low (particularly outside Wollongong), which reflects the relatively low proportion of workers who are managers and professionals.

Chart 6.4: Share of workforce with a post-school qualification

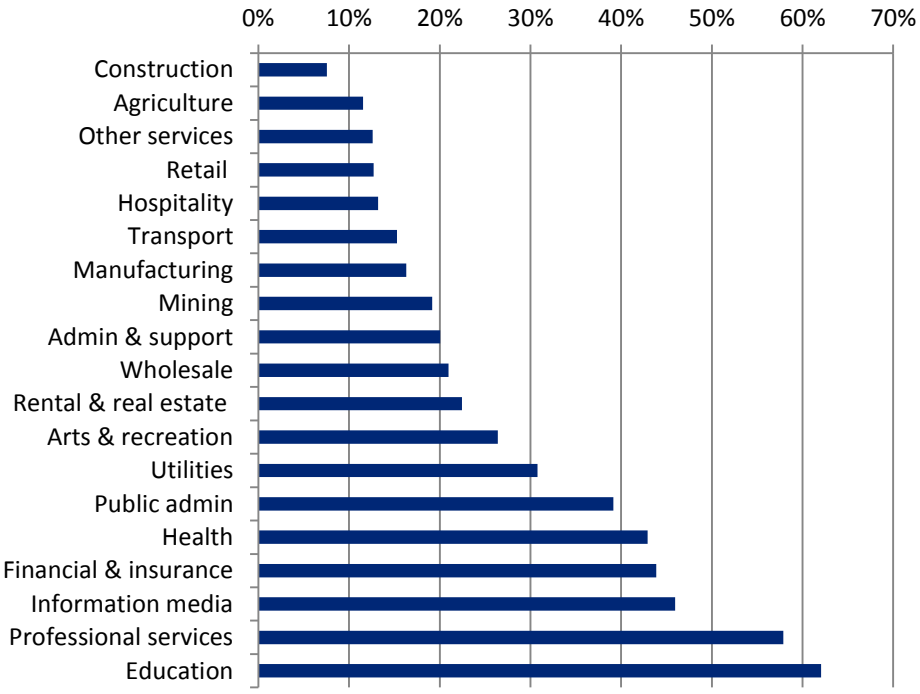


Source: 2011 Census

In developing the appropriate human capital it is expected that the University of Wollongong (UOW) will continue to play a critical role in ensuring the needs of employers are met. UOW's input to the development of Australia's stock of human capital was estimated to be $1.34 billion in 2012 (UOW 2013).

One strategy to build the region's human capital is to focus on industries that require workers with high levels of human capital. This can both attract new workers to the region and encourage graduates from the UOW to stay in the region. Chart 6.5 shows the proportion of employees with a bachelor's degree across the nineteen ANZSIC industries. The industries with the highest proportion of university qualified employees are education, professional services, information media and telecommunications, finance and insurance, and health.

Chart 6.5: Proportion of employees with bachelor's degree or higher



Source: ABS 6227.0.

> The five industries with the highest level of human capital are education, professional services, information media, finance and insurance and health care and social assistance.

6.1.6 Conclusion

Based on average rankings across the five factors discussed above, education, health care and social assistance, mining and professional services had the lowest average rank (with lower average rank indicating better performance).

As noted above the tourism industry is spread across a number of industries and though the export potential is significant as a proportion of the industries considered, tourism overall ranks 9th in export potential. Thus as a whole the final results are not sensitive to the impact of the export potential of tourism.

> Overall, the four industries that emerge based on this analysis are: education and training; health care and social assistance; mining; and professional, services.

Based on these results and consultation with RDA Illawarra it was decided that the supply chain analysis would focus on health care and social assistance and professional services. While education emerged as the industry with the lowest average rank, it was considered that health care and professional services would have more complex supply chain linkages

in the region. Mining was also highly ranked but its future employment growth forecasts suggested that it did not have strong employment growth prospects over the longer term.

6.2 Current trends and demand analysis

In the sections below the health care and social assistance and professional services sectors are described in detail, along with key trends in the respective sectors and the outlook for future growth in demand. An extensive discussion of their respective supply chains is then undertaken. The final subsection discusses the occupation profile of workers in both these sectors.

6.2.1 Professional services

Current trends

According to the ABS:

> *"The Professional, Scientific and Technical Services Division includes units mainly engaged in providing professional, scientific and technical services. Units engaged in providing these services apply common processes where labour inputs are integral to the production or service delivery. Units in this division specialise and sell their expertise. In most cases, equipment and materials are not major inputs. The activities undertaken generally require a high level of expertise and training and formal (usually tertiary level) qualifications.*
>
> *These services include scientific research, architecture, engineering, computer systems design, law, accountancy, advertising, market research, management and other consultancy, veterinary science and professional photography." (ABS 2013)*

At the 2011 Census, this division made up about 5% of total employment in the region and was the eighth largest employer in the region. From 2006 to 2011, employment in the sector grew 1.4% on average. In terms of recent growth, this division was the 11th fastest growing industry in the region.

Compared to NSW and Australia, professional services grew more slowly in the Illawarra. Furthermore, relative to Australia and NSW the proportion of people employed in the professional services sector in the Illawarra is relatively low. We do note that this is one sector that could expand in the near future and there could be a "catch-up" effect. According to the Survey of Employers' Recruitment Experiences, the region had unfilled vacancies for managers and professionals. This shortage is also highlighted by the fact that accountants were one of the more difficult occupations to fill in the region.

If we examine the trends which have affected this sector, there is little doubt that the rise of Asia has played an important role in affecting the demand for these services. According to the Department of Foreign Affairs and Trade, Australia's largest overall export partners were China, Japan and South Korea. A summary of Australia's top 10 export markets in 2012 is presented in Table 6.2 (goods) and Table 6.3 (services).

Table 6.2: Australia's Top 10 Export Markets for merchandise in 2012 ($b)

Country	Merchandise	Merchandise growth since 2000 (CAGR)
China	73.0	23.1%
Japan	47.8	6.8%
Republic of Korea	19.8	6.7%
India	12.2	17.1%
United States of America	9.4	-1.3%
Taiwan	8.0	3.1%
New Zealand	7.4	1.0%
Singapore	7.1	1.6%
United Kingdom	6.7	4.9%
Malaysia	5.1	6.6%

Source: ABS 5368.0

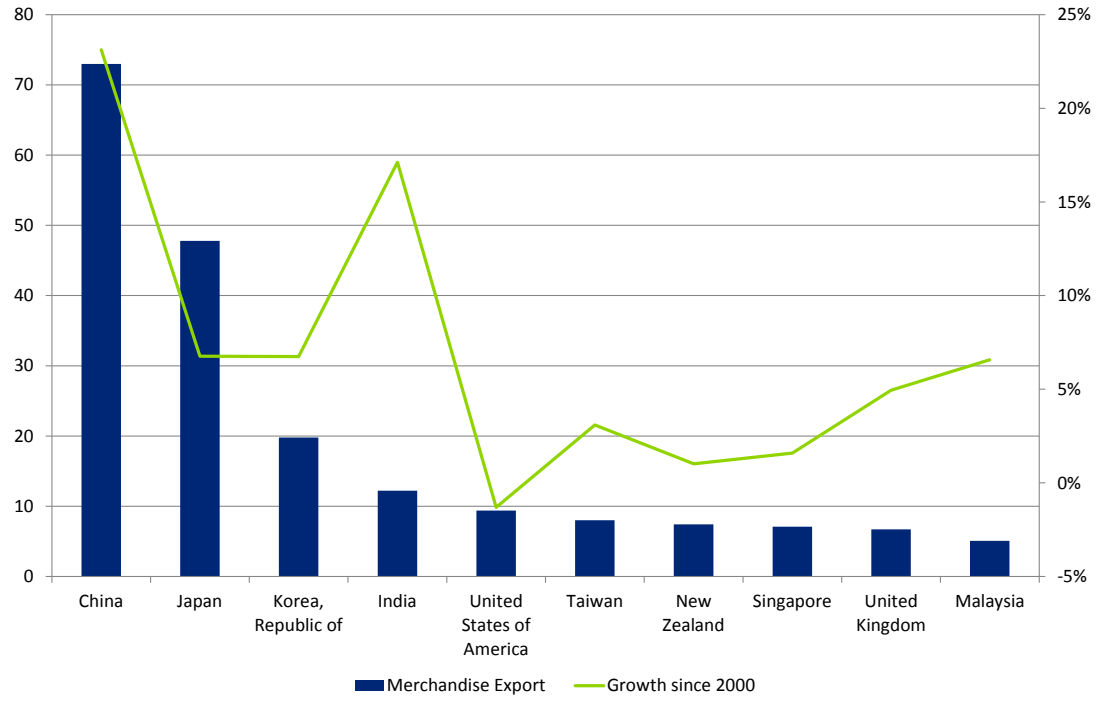
Table 6.3: Australia's Top 10 Export Markets for services in 2012 ($b)

Country	Services	Services growth since 2000 (CAGR)
China	5.7	17.7%
United States of America	5.3	-0.5%
United Kingdom	3.9	0.0%
New Zealand	3.7	2.5%
Singapore	3.2	4.5%
Japan	2.0	-4.5%
India	1.8	11.8%
Korea	1.8	7.0%
Hong Kong	1.7	3.1%
Malaysia	1.7	5.2%

Source: ABS 5368.0.55.004

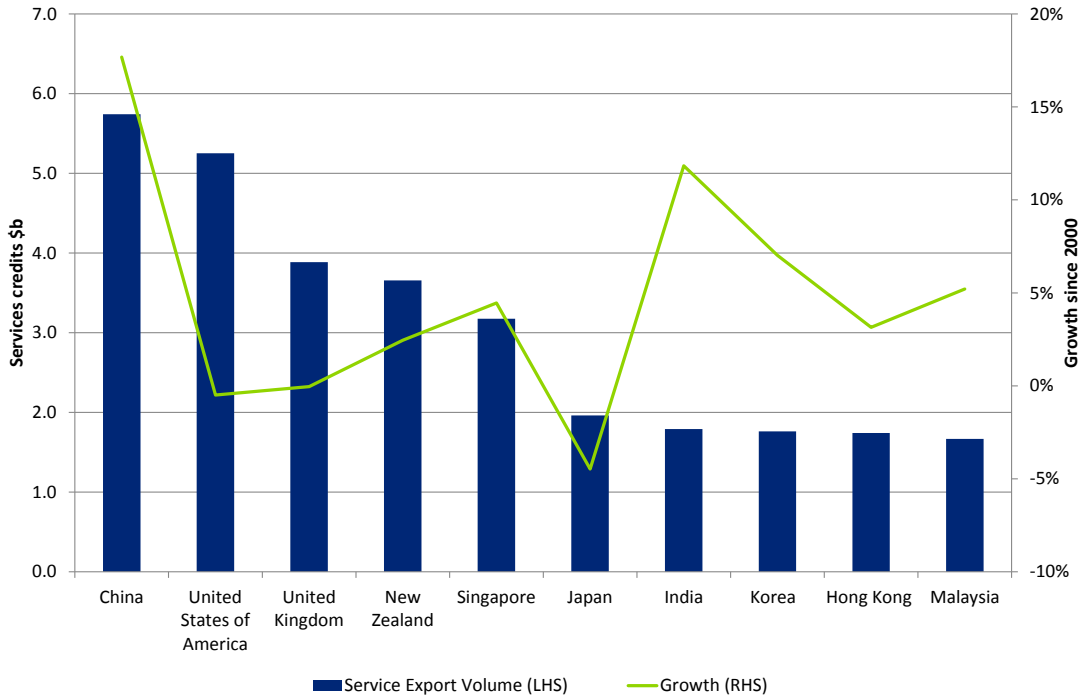
The largest export markets for Australian services were China, the United States and the United Kingdom. While services exports continue to predominately flow to developed, westernised economies, seven of the top 10 markets in 2012 were Asian economies. This highlights the importance of the rise of Asia for the services sector. Chart 6.6 and Chart 6.7 show the level of merchandise and services exports by trading partner, as well as growth in export values since 2000.

Chart 6.6: Exports of merchandise by country 2012 $b



Source: ABS 5368.0

Chart 6.7: Exports of services by country 2012 $m



Source: ABS 5368.0

It is also interesting to note that four Asian countries were also in the top 10 in terms of growth in the export of services. These countries were China, India, the Philippines and Korea. This suggests that the rise of Asia will play a pivotal role in expanding the demand for Australian services over time.

A further trend impacting on the professional services sector is the general degree of upskilling that has pervaded the economy over the past couple decades, and is expected to continue throughout the projection period (see section 4.3). Professional services employ a disproportionately high number of relatively higher skilled workers (professionals, managers and clerical and admin workers) and as such the trend of upskilling is likely to lead to an increase in the supply of these workers and the growth of this sector over time.

At a more local level, we note that a number of Government Departments have relocated to the Illawarra region, in particular some parts of the Australian Taxation Office which have relocated to Wollongong. This trend is also likely to impact the demand for professional services in the region.

Demand analysis and future demand

Professional services are expected to grow the second fastest in absolute terms in the Illawarra region over the next five years (see Table 4.1 in Chapter 4).

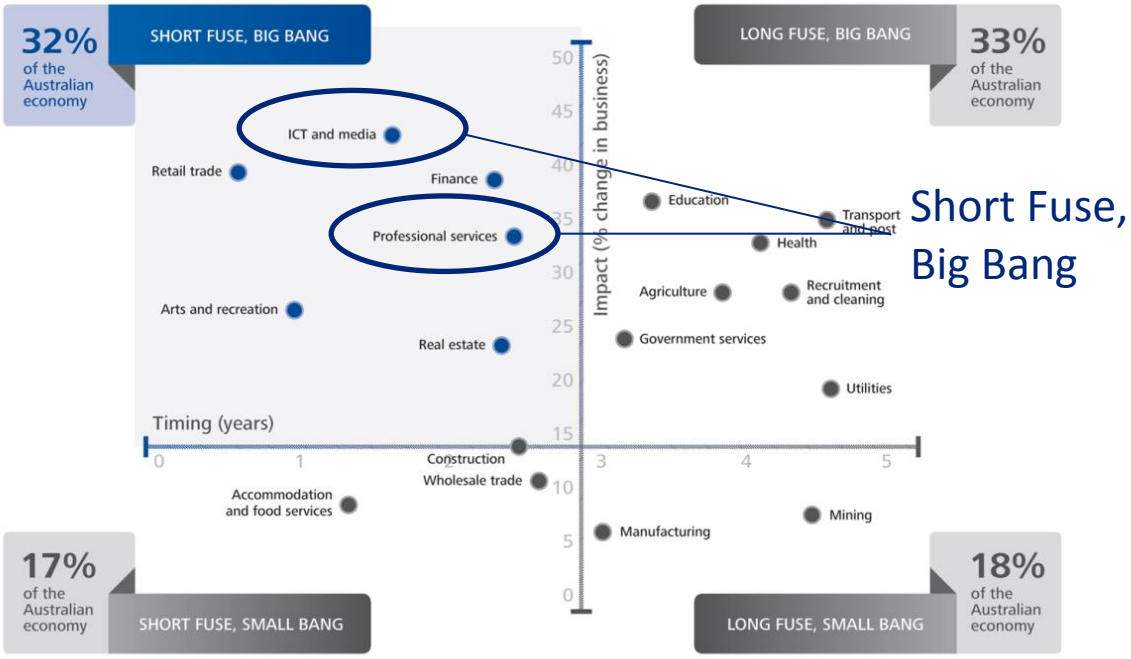
In the medium to longer term, i.e. 2018-2033, professional services are expected to feature in the top seven sectors in terms of absolute growth, and the top five sectors based on average annual growth.

Given the positive growth prospects for the sector, we will examine some of the factors which may affect the future demand for these services. In general we believe that two factors will play a significant role in affecting the projected demand and growth of this sector:

- technological change and telework; and
- broader market definition and competition.

To look at the impact of technology on the sector, Deloitte's 'Digital Disruption' map is used. The map examines the ANZSIC industries and compares their vulnerability to disruption from two perspectives: the size of the impact as well as the imminence of change. The map considers the extent to which digital disruption will affect specific industries, plus the timing of that disruption. This gives us a ranking of how different industries will be more or less affected (the size of the 'bang'), as well as the time frame over which these changes can be expected to occur (the length of the 'fuse').

Figure 6.1: Deloitte digital disruption map for professional services



Source: Deloitte Access Economics

In general, professional services fall in the "short fuse, big bang" quadrant. This implies that technology will have a significant impact on the sector in a relatively short space in time. The implication of this is that technology will play a major role in determining the growth trajectory of the sector. It will require the players to be adaptable to ensure that they can compete in the market.

The size of the impact on professional services reflects the fact that in many ways it is an 'outsourcing industry'; other industry sectors consume over 95% of the output of this industry. Since professional services are generally an intermediate input to other industries, and technology has closed the distance between players, this sector has been able to expand its presence both geographically as well as in terms of the type of services on offer.

As technology improves the ability to work remotely from home, firms and workers in the Illawarra region will have access to a wider market. However, at the same time, by breaking down traditional barriers and making distance less of an issue, professional services firms outside the Illawarra may increasingly be able to compete for work within the region. In simple terms, digital disruption will bring both opportunities and challenges to the professional services sector over time.

Thus the net effect on professional services firms both in the Illawarra and across Australia will depend on the extent to which they are able to harness the opportunities, and adapt to the challenges, presented by digital disruption.

6.2.2 Health care and social assistance

Current trends

This division includes units mainly engaged in providing human health care and social assistance. According to the ABS:

> *"The Health Care and Social Assistance Division includes units mainly engaged in providing human health care and social assistance. Units engaged in providing these services apply common processes, where the labour inputs of practitioners with the requisite expertise and qualifications are integral to production or service delivery" (ABS 2013)*

Health Care and Social Assistance[6] is one of 19 ANZSIC industries. Within Health Care and Social Assistance, it is further broken down into four subcategories

- Hospitals;
- Medical and Other Health Care Services;
- Residential Care Services; and
- Social Assistance Services.

Residential care services are further segregated into:

- Aged care residential services; and
- Other residential care services;

With regards to aged care residential services, the ABS states:

> *"This class consists of units mainly engaged in providing residential aged care combined with either nursing, supervisory or other types of care as required (including medical).*
>
> *Primary activities*
>
> - *Accommodation for the aged operation*
> - *Aged care hostel operation*
> - *Nursing home operation*
> - *Residential care for the aged operation " (ABS 2006)*

With regards to other residential care services, the ABS states:

> *"This class consists of units mainly engaged in providing residential care (except aged care) combined with either nursing, supervisory or other types of care as required (including medical).*
>
> *Primary activities*
>
> - *Children's home operation*
> - *Community mental health hostel*
> - *Crisis care accommodation operation*
> - *Home for the disadvantaged operation n.e.c.*
> - *Hospice operation*
> - *Residential refuge operation*
> - *Respite residential care operation" (ABS 2006)*

[6] Which for simplicity is referred to throughout this report as health care

For the purposes of analysing the supply chain, we use the ABS IO tables to determine where the industry draws its inputs and who their consumers are. For these purposes in analysing the health care sector we use the IO category of health care, and for aged care we use residential care.

At the 2011 Census, this division made up about 15.3% of total employment in the region and was the largest employer in the region. Since 2006, employment in the health care sector grew by around 25.3% or around 4.6% per annum on average. It was the second fastest growing industry in the Illawarra, and grew quicker than the NSW average and about on par with the Australian average between the 2006 and 2011 Census.

Furthermore, relative to Australia and NSW, the proportion of the workforce employed in the health care sector is significantly larger in the Illawarra than both in NSW and Australia as a whole – it accounts for only about 12% of the NSW and Australian workforces.

According to the Survey of Employers' Recruitment Experiences, the region had difficulties in finding registered nurses. There also appears to be limited numbers of qualified workers in the community services sector. The survey indicated that the average number of applicants per vacancy for community and personal service workers was 7.6, however only 2.4 were considered suitable for employment. This implies that labour supply is an issue in the community services sector.

Table 6.4 shows the strong growth in health expenditure over the past ten years, a trend that only figures to continue looking forward.

Table 6.4: Total health spending through time

Year	Amount ($m nominal)	Change from previous year
2001–02	63,099	. .
2002–03	68,798	9.0
2003–04	73,509	6.8
2004–05	81,061	10.3
2005–06	86,685	6.9
2006–07	94,938	9.5
2007–08	103,563	9.1
2008–09	113,661	9.8
2009–10	121,353	6.8
2010–11	130,310	7.4
2011–12	140,241	7.6

Source: Australian Institute of Health and Welfare

Demand analysis and future demand

As noted in Chapter 4, health care is expected to be the fastest growing sector over both the short term (i.e. 2013-2018) as well as the entire projection period (2018-2033). Given the positive growth prospects, we will examine some of the factors which may affect this sector and its future prospects. In general we believe that:

- the ageing population,
- sea/tree change, and
- digital disruption,

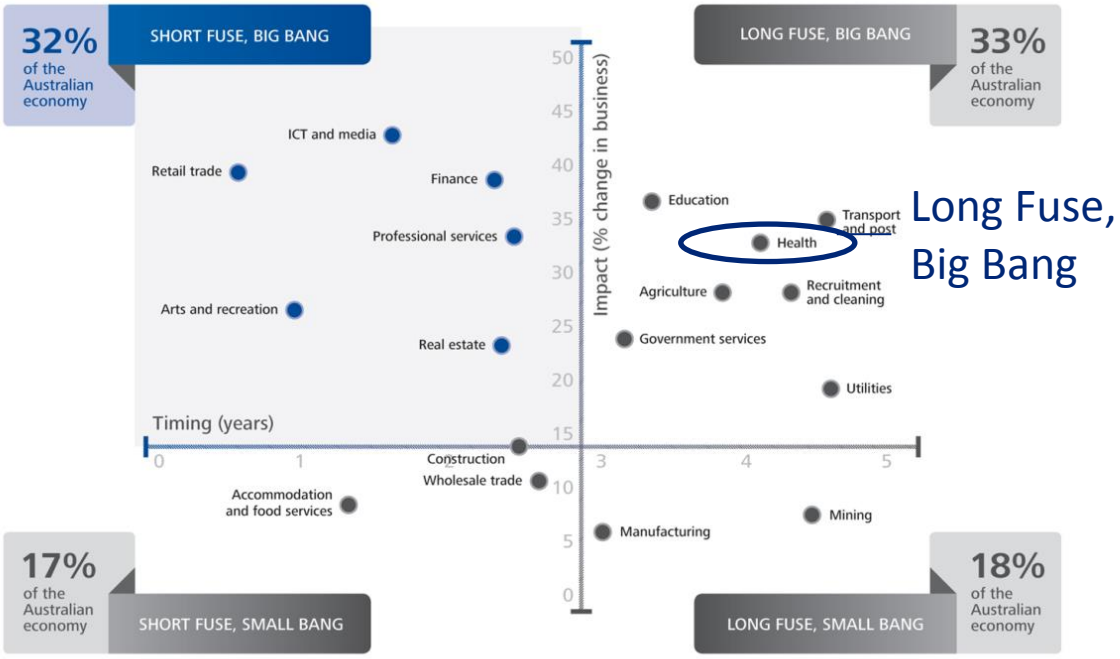
will all play a role in affecting this sector.

As noted in Appendix A the Illawarra region has a relatively older age profile than both NSW and Australia as a whole.

This would naturally increase the demand for health and aged care services as elderly people are more likely to need these services. Further, the Illawarra's population is expected to age more quickly relative to the State average, which will accelerate the demand for these services. This increase in demand will be compounded if elderly citizens in other regions also choose to retire to the Illawarra region to enjoy a coastal lifestyle. Retirees who want a 'sea change' or 'tree change' are going to view regions such as the Illawarra very favourably. The fact that it is also relatively close to Sydney makes the region even more attractive.

Digital disruption is another major trend which may affect the health sector. If we examine the Deloitte disruption map we find that health is in the 'long fuse, big bang' quadrant.

Figure 6.2: Deloitte digital disruption map for health care



Source: Deloitte Access Economics

This implies that health care will experience significant changes in its business model and delivery but that these changes will occur over a long time horizon. As health care involves a relatively high level of person to person interaction, on one level the extent of digital disruption may be limited. On another level, there is significant scope for digital trends such as telehealth or the remote delivery of health services to impact the industry over time.

6.3 Overview of the supply chain

To examine the supply chain for these two sectors, two main dimensions are considered:

- a geographic dimension; and
- an industry dimension.

The geographic dimension examines the level of impact that an industry has relative to the rest of Australia. That is, to what extent does the economic activity 'stay' in the Illawarra region? The industry dimension examines the key industries which supply inputs to the sector and the industries that demand the sector's outputs.

6.3.1 Methodology

To examine the geographic dimension, we examine the value of each of the sectors from both a regional level and a national level. Value added measures the value of goods and services produced by an entity's factors of production (i.e. labour and capital) as reflected in the income to those factors of production (wages and gross operating surplus or GOS).

The sum of value added across all entities in the economy equals gross domestic product (GDP). The value added is decomposed into direct value added and indirect value added. Indirect value added measures the flow on effects due to the expenditure of the industry on intermediate inputs. The direct value added is paid to workers and capital owners in the Illawarra region. However, the indirect value added can occur both in the Illawarra and the rest of Australia.

To obtain these values we examined the annual reports of four firms to obtain a picture of the industry within the region. The four firms which we examined are:

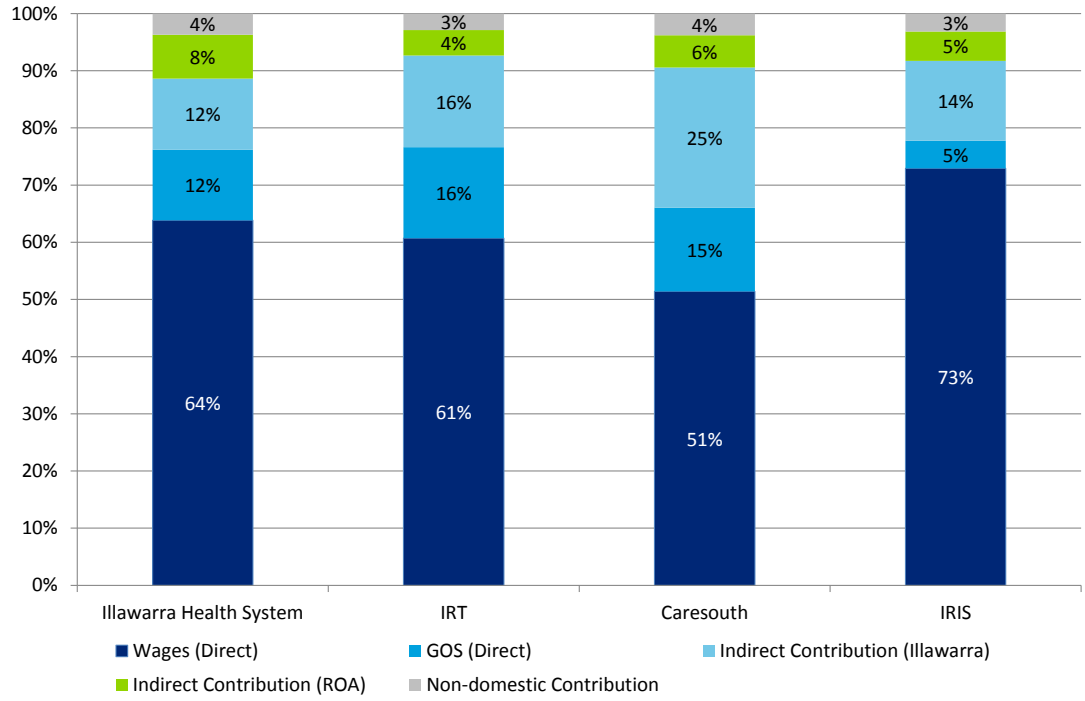
- The Illawarra Shoalhaven Local Health District to represent the health care sector;
- IRT (not-for-profit provider), to represent the health care and social assistance sector with an aged care focus;
- Caresouth, to represent the social assistance aspect of the health care and social assistance sector; and
- IRIS Research, to represent the professional services sector.

The annual reports of these organisations were used to determine the direct value added of these organisations. The organisations' expenditure on intermediate inputs were then obtained and accordingly categorised based on the ABS IO categories to determine the indirect value added within the Illawarra and Australia. It is assumed that the cost structures of these firms are representative of the industry in the region. However, we do acknowledge the limitations of this analysis if other firms have very different cost structures. In particular, we had few professional services firms to rely on because it is a sector dominated by partnerships rather than corporations, which are not required to publish public annual reports.

6.3.2 Geographic analysis

This section will demonstrate the extent to which the value added is contained within the region relative to the rest of Australia. A summary of our results is presented in Chart 6.8.

Chart 6.8: Decomposition of value added by destination



Source: Deloitte Access Economics

The direct value added is the sum of GOS and wages and measures the economic contribution of the firm. In general, wages measure the return to labour and GOS measures the return to capital. It is worth noting that GOS captures depreciation and amortisation.

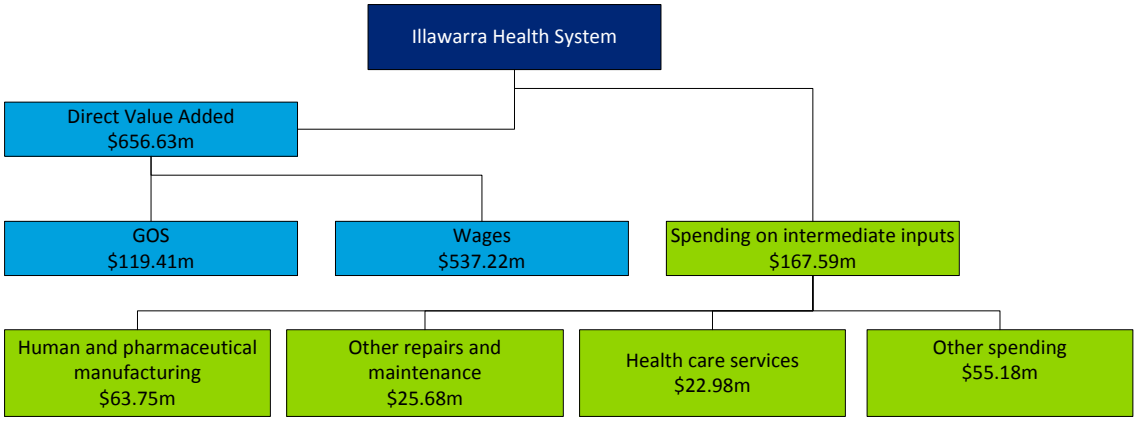
In general we found that the direct value added made up between 66% and 77% for the health care firms and 78% for the professional services firm. These results suggest that the bulk of the economic activity is generated by the firms themselves and that the flow on (indirect) impact is smaller. This is somewhat unsurprising as these industries are labour intensive, with localised economic impacts.

To understand the counter example, consider an industry like retail trade, where a majority of the final output is produced by the manufacturers and others along the supply chain, not the shop front itself. In such an industry, the majority of economic impacts can occur outside the region.

One important point that is not captured in Chart 6.8 is the fact that some aged care or social assistance providers that are Illawarra based can have operations outside the Illawarra. For example, both IRT and Warrigal operate outside the region and the potential for servicing other regions is an important factor in the sector's potential growth.

To complete this picture, we provide flow charts illustrating the main sectors where expenditure on intermediate inputs flows. For example, the Illawarra health system spent $63.75 million on human and pharmaceutical manufacturing and $25.7 million in other repairs and maintenance as shown in the green shaded boxes in Figure 6.3:

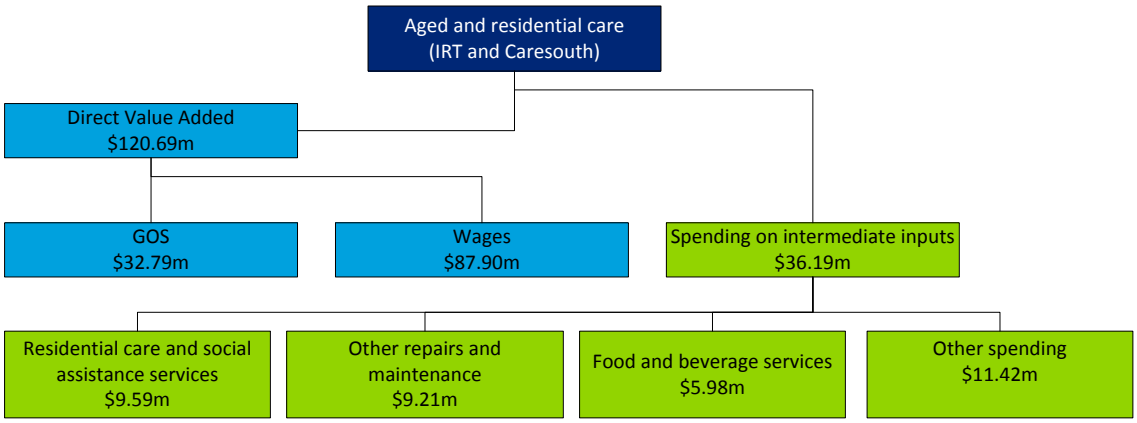
Figure 6.3: Illawarra health system profile



Source: Deloitte Access Economics

A summary of the aged and residential care industry (IRT and Caresouth) profile is represented below in Figure 6.4.

Figure 6.4: Aged and residential care profile

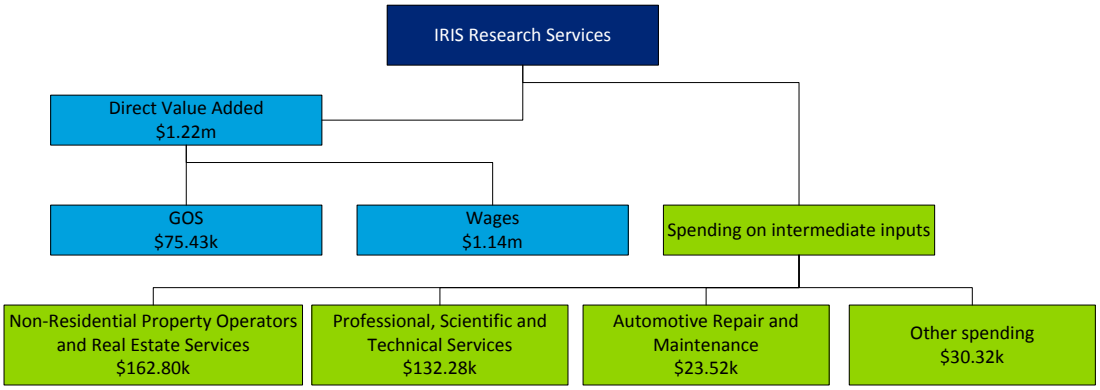


Source: Deloitte Access Economics

One of the key findings of this analysis is that for both the Illawarra health system and IRT, wages make up a very large proportion of total economic contribution. This is unsurprising as the health system employs a significant proportion of high skilled labour. Unsurprisingly, GOS as a proportion of direct value added for the Illawarra health system is lower than IRT, because the former is a public institution whose main objective is not to maximise profits.

A summary of the professional services (IRIS Research) industry profile is represented below in Figure 6.5.

Figure 6.5: IRIS research profile



Source: Deloitte Access Economics

Using the figures in Figure 6.3, we find that for the health care firms, the indirect value added (in the Illawarra) made up between 12% and 16% of total revenue compared to 5% for the professional services firm. One of the interesting finding about IRIS is that given it is a research firm it would employ researchers and other high skilled labour. This would explain the high contribution of wages to the total economic contribution. Furthermore, the low GOS may reflect the fact that the industry is very competitive and the margins on the services provided are small. We also note that the industry has relatively low demand for intermediate goods and a relatively small indirect contribution.

The results show that the total value added for these firms in the Illawarra region was between 88% and 93% of the total output. This result suggests that much of the economic activity remains within the region. In fact, if we expand the indirect impact to cover Australia the total contribution proportion increases to over 95% for all the firms examined.

6.3.3 Industry analysis

The industry analysis examines the impact of these two sectors on other firms. To do this we examine where the inputs are sourced and who the industries' main consumers are.

Health care

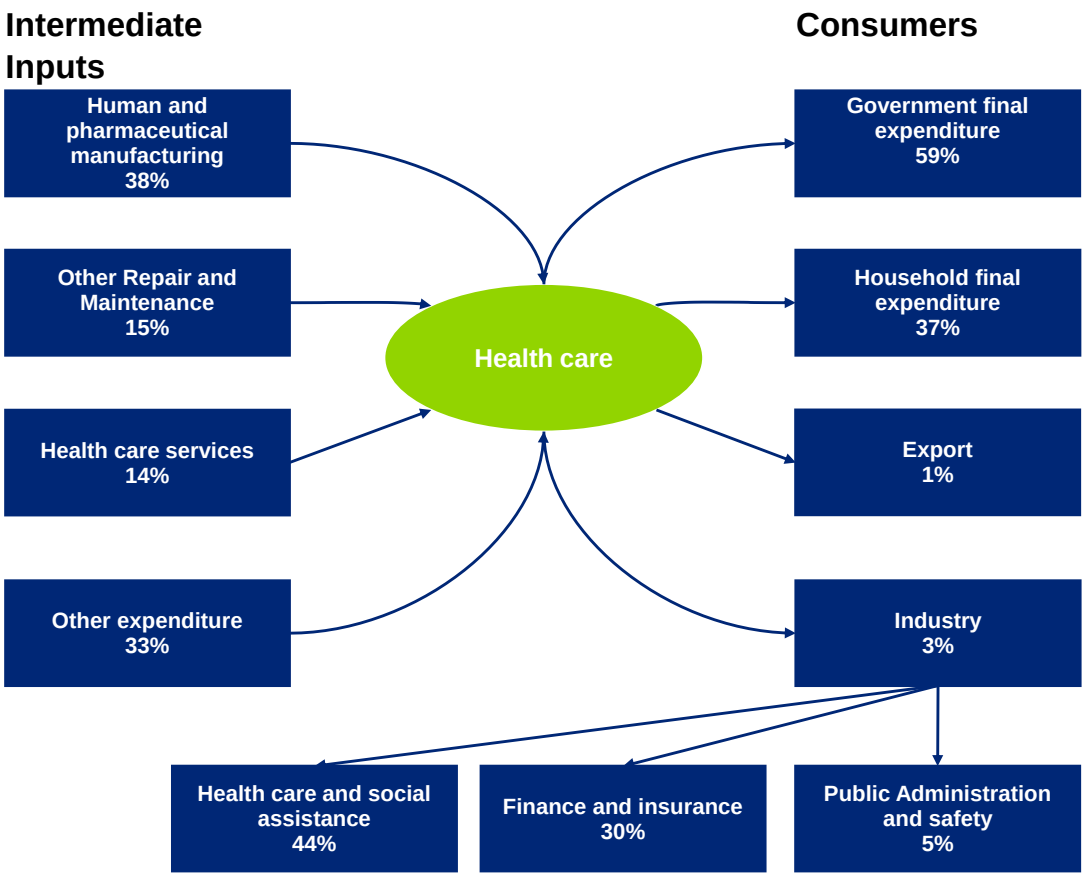
For the health care and social assistance industry, expenditure on intermediate inputs is composed of human and pharmaceutical manufacturing, which makes up 38% of total operating expenditure; other repair and maintenance, which makes up 15%; and health care services, which contributes 14%.

The main purchasers of health care are consumers, reflected in the 59% going to government final expenditure and 37% to households (see Figure 6.6). Only 3% goes to other industry use. This implies that the industry's performance will be driven by consumers and that government policy decisions will have a big impact on the size of the sector.

For the 3% of outputs that are used by industry, we note that the biggest consumers of the health care industry include health care and social assistance itself, finance and insurance, and public administration and safety. However, it is worth noting that only 3% of the total

value was for industry use. Thus the output/revenue of this sector is not heavily dependent on the performance of other industries. A summary of this supply chain is presented in Figure 6.6.

Figure 6.6: Health care supply chain



Source: Deloitte Access Economics and ABS 5209.0 2009-10

Residential care and social assistance

This section is focused on aged care activities as they pertain to the health care and social assistance sector. In practice, aged care residents are likely to demand goods and services from a number of other sectors such as gardening services, cleaning, personal services, catering, entertainment, household maintenance, etc., which may not fall under the health care and social assistance sector, although in some cases will be captured in inputs to the sector. For example gardening services may be provided by an aged care provider.

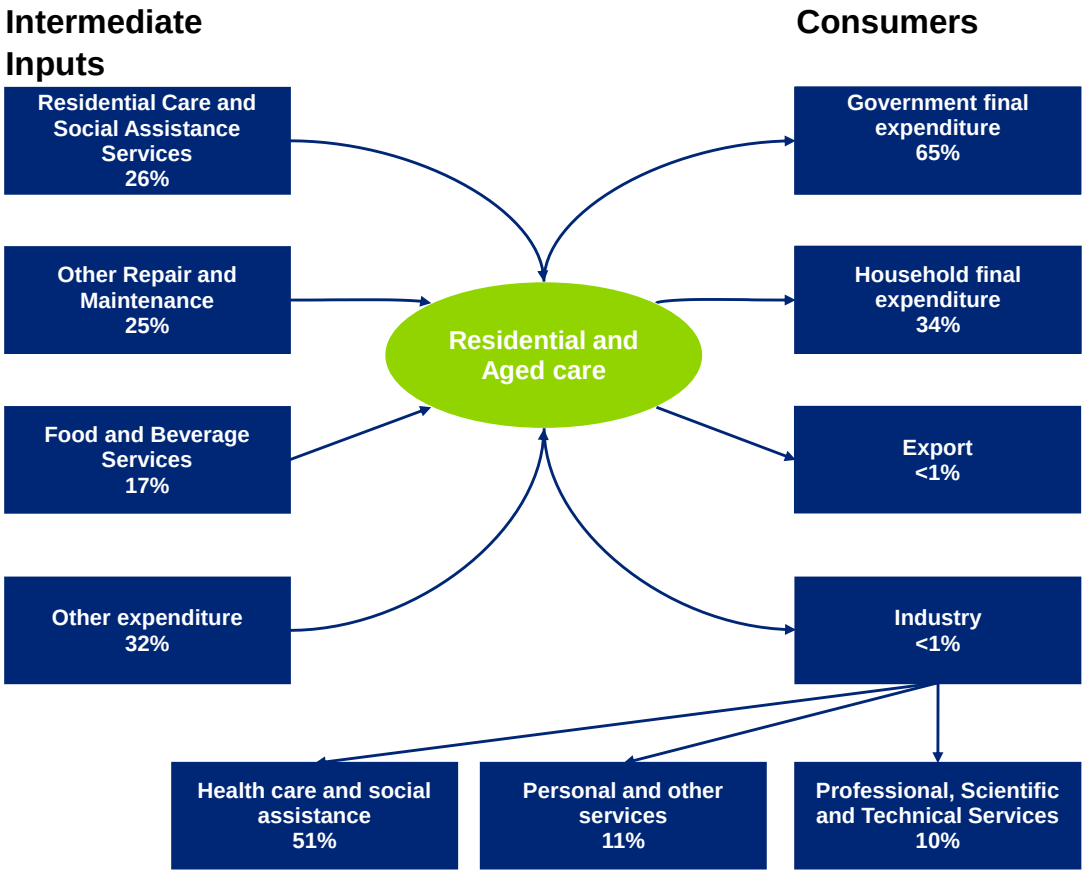
Nonetheless, the demand for aged care services which fall outside the health care sector is likely to be quite substantial and while this is not the focus of this section it is an important aspect of the economic activity associated with aged care in the region.

The main consumers of residential care and social assistance are government, which makes up around 65% of total consumption; and households, which make up 34% of consumption. This reflects the fact that residential care and social assistance services are largely government subsidised.[7] Only 0.4% is for other industry use (see Figure 2.5). Thus the demanders of residential care and social assistance are largely similar to those for health care.

The main industries supplying to the sector are other repairs and maintenance, food and beverage services and the sector itself.

Of the 0.4% of of residential care and social assistance output which is supplied to industry, we note that the biggest consumers of the residential care and social assistance industry include health care and social assistance, personal and other services and professional services industries. However, it is worth again noting that other industries accounted for only 0.4% of total consumption of residential aged care and social assistance services. Thus, other industries are not heavily dependent on the output of this sector.

Figure 6.7: Residential aged care and social assistance supply chain



Source: Deloitte Access Economics and ABS 5209.0 2009-10

[7] Though it is noteworthy that part of the *Living Longer Living Better* package announced in mid-2012 is a shift toward a more flexible, demand driven, residential aged care sector, meaning the government dominance of the aged care sector in future may not be so pronounced.

Professional services

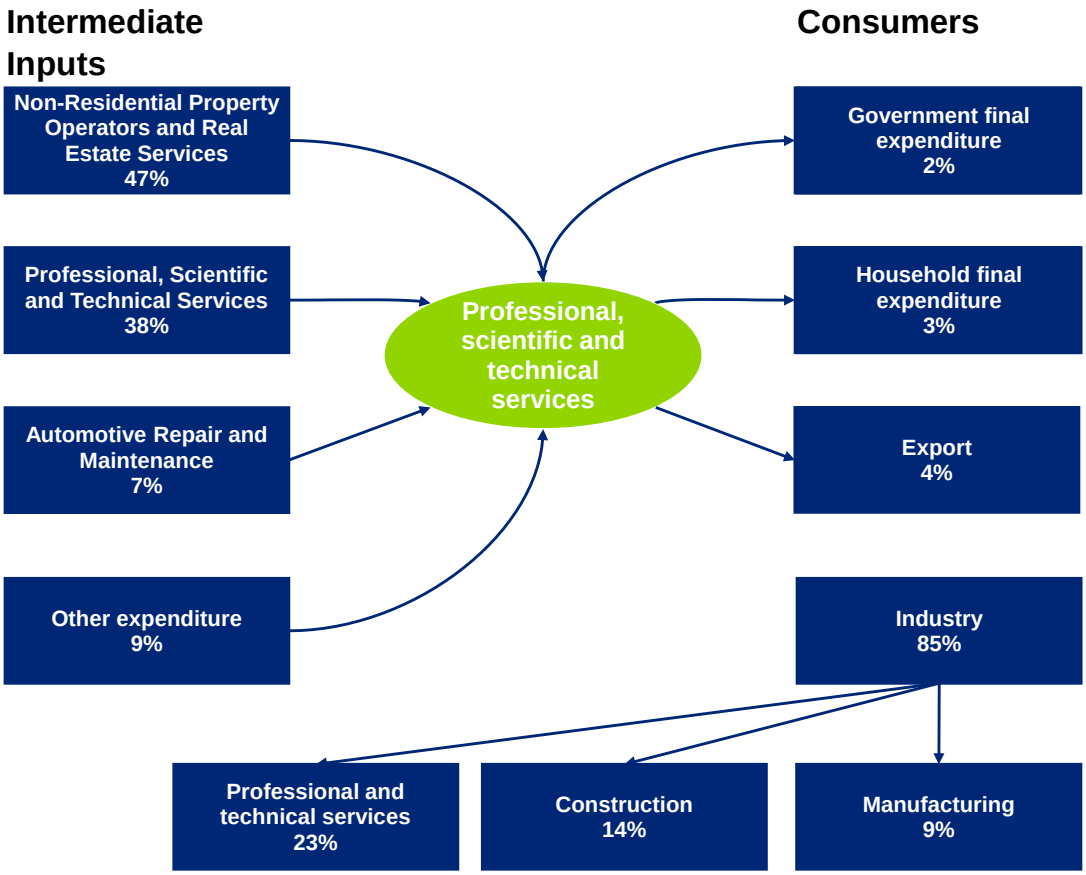
For the professional services industry the main intermediate inputs flowing into the sector are non-residential property operators and real estate Services, which makes up 47% of total operating expenditure; professional, scientific and technical Services, which makes up 38%; and automotive repair and maintenance, which contributes 7%. The remaining expenditure makes up 9%.

Unlike health care and social assistance, the main consumers of professional services are other industries, which make up around 85% of total consumption. Household final expenditure makes up 3%, with a further 2% classified as government final expenditure. The biggest consumers of professional services include the professional services sector itself, construction and manufacturing.

Given the fact that the primary consumers are other firms rather than the government or final consumers, this implies that the performance of this sector would be heavily affected by the performance of the broader economy. The business cycle would play a significant role in determining the performance of these firms.

A summary this supply chain is presented in Figure 6.8.

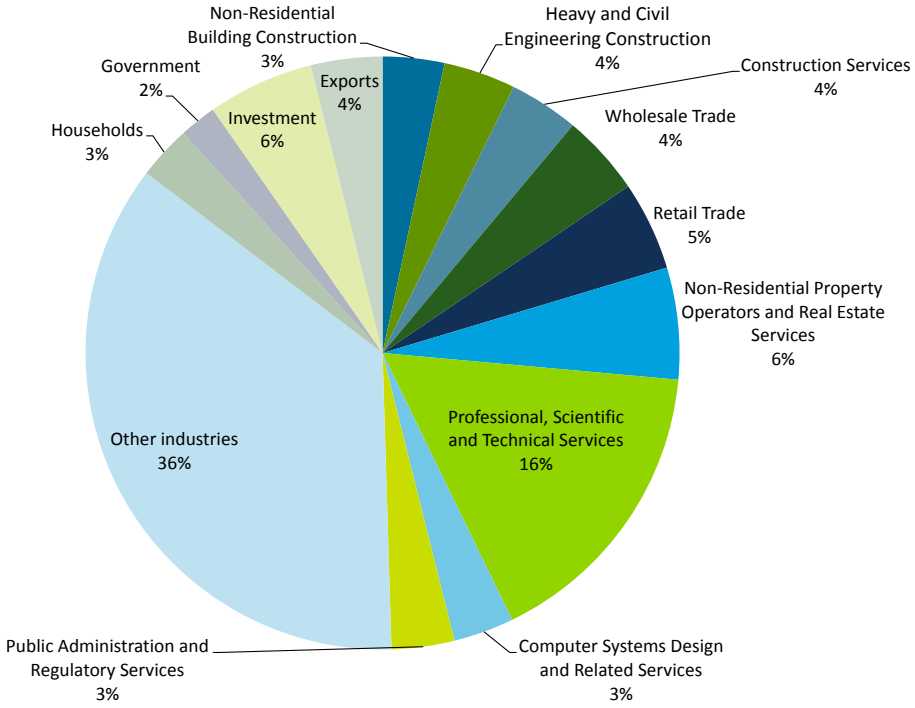
Figure 6.8: Professional and technical services supply chain



Source: Deloitte Access Economics and ABS 5209.0 2009-10

For further details regarding the main consumers of these services see Chart 6.9.

Chart 6.9: Professional, Scientific and Technical Services



Source: ABS 5209.0 2009-10

6.3.4 Conclusion

The geographic analysis suggests that the benefits of growth in these industries will primarily remain in the Illawarra region. Thus these industries have significant potential to influence the economic development of the region.

The supply chain analysis suggests that for health care and aged care and social assistance, the main consumers are the government and households. This implies that to grow the health care industry, emphasis should be placed upon attracting final consumers into the region. By contrast, professional services are mainly an intermediate input for other industries. Thus their growth would be dependent on the growth of other industries.

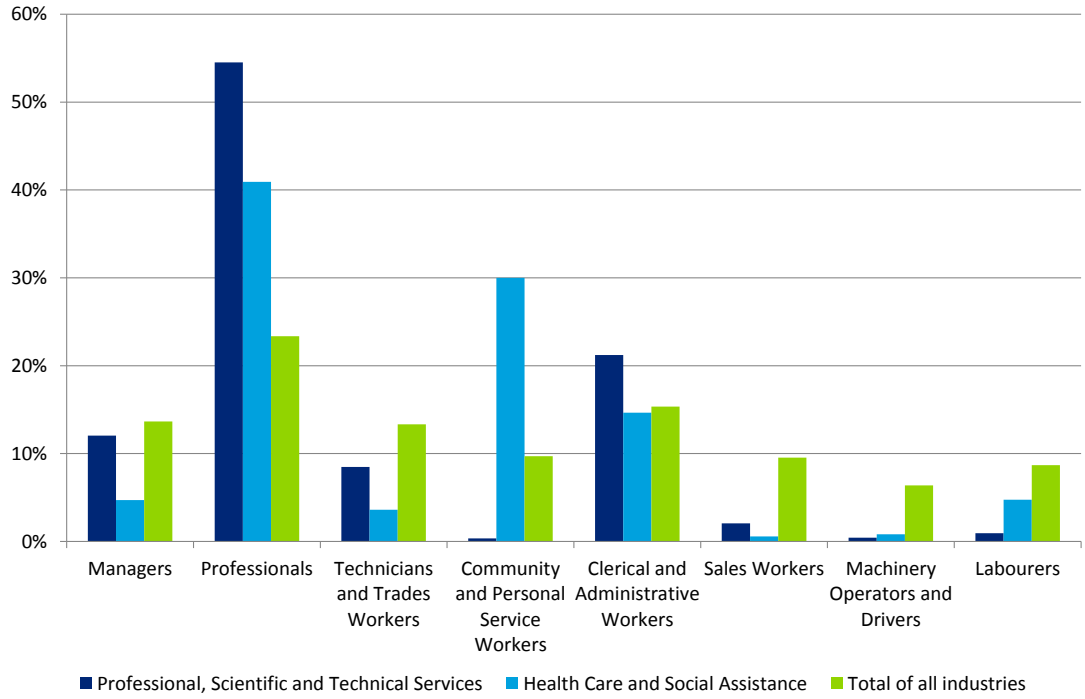
6.4 Occupational analysis

This part of the analysis examines the labour requirements of the two industries of interest from an occupational perspective. It will examine it from the perspective of the Illawarra and NSW and how the two profiles differ.

If we look into the labour profile of professional services and health care relative to all industries, we find that the professional services employs a higher proportion of professionals and clerical and administrative workers. Unsurprisingly, it employs fewer community and personal service workers and sales workers, and virtually no machine operators and drivers or labourers. The health care sector employs disproportionately more community and personal service workers and professionals. The sector employs

significantly fewer managers, technicians and trades workers, sales workers, machinery operators and drivers and labourers. These findings are summarised below in Chart 6.10.

Chart 6.10: Labour profile of industries by occupation in NSW



Source: ABS Census 2011

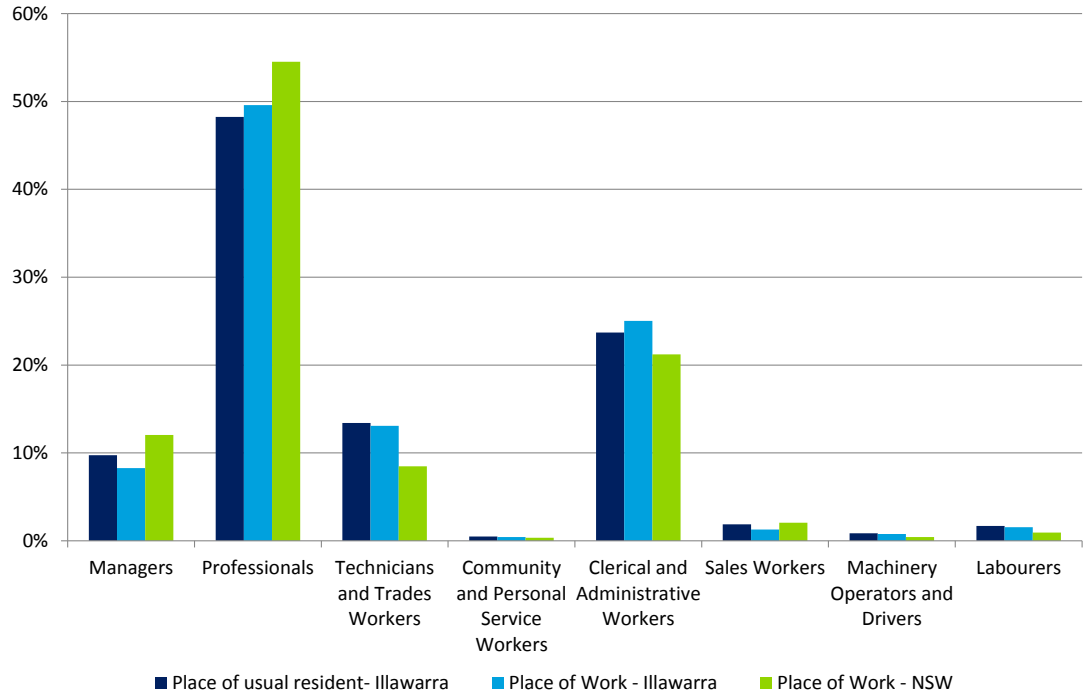
In conjunction with the occupational and qualification projections presented in sections 4.3 and 4.4, this analysis tells us that growth in the professional services and health care and social assistance sectors will require concurrent growth in suitably qualified professionals and clerical and administrative workers. For the health care sectors, there will be additional strong demand for community and personal service workers.

To complete this analysis we compare the occupations of people residing in NSW and the Illawarra. Overall, we note that the Illawarra has relatively fewer managers, professionals, and clerical and administrative workers (see Chart 6.2). The Illawarra has relatively more community and personal service workers, technicians and trades workers and machinery operators and drivers. For professional services, we find that the Illawarra currently employs fewer professionals and managers living in the area compared to the proportion employed in NSW (see Chart 6.11).

The chart suggests that the region's professional services sector is 'exporting' managers, since the proportion of managers with Illawarra as their usual place of residence exceeds the proportion whose place of work is the Illawarra.

It is worth noting that the professional services sector in the Illawarra employs relatively more technicians and trades workers and clerical and administrative workers, which could in part reflect the extent to which the sector provides technical advice to mining and manufacturing firms, or provides services which are more focused on providing administrative assistance to other firms (e.g. 'back office' support functions).

Chart 6.11: Professional, scientific and technical services labour profile



Source: ABS Census 2011

An apparent shortage of professionals in the Illawarra seems to be one of the factors which is restraining growth in the professional services sector. According to the Illawarra Priority Employment Area (PEA) survey conducted in November 2012 one of the most difficult positions to fill in the Illawarra region was an accountant. However, the study also finds that managers and professionals were one of the more competitive categories for vacancies in the Illawarra.

The average number of applicants per vacancy was 11.3. However the average number of suitable applicants was only 4.2. Thus a number of applicants for each vacancy were not seen as being suitably qualified. The main reasons given for candidates being unsuitable included:

- not enough experience;
- skills and personal characteristics; and
- lack of qualifications/training.

Thus the skills of many applicants for professional roles in the region are mismatched to employer needs.

For the health care industry, we find that the Illawarra currently employs fewer professionals relative to NSW (see Chart 6.12). These results are somewhat similar to the professional services industry.

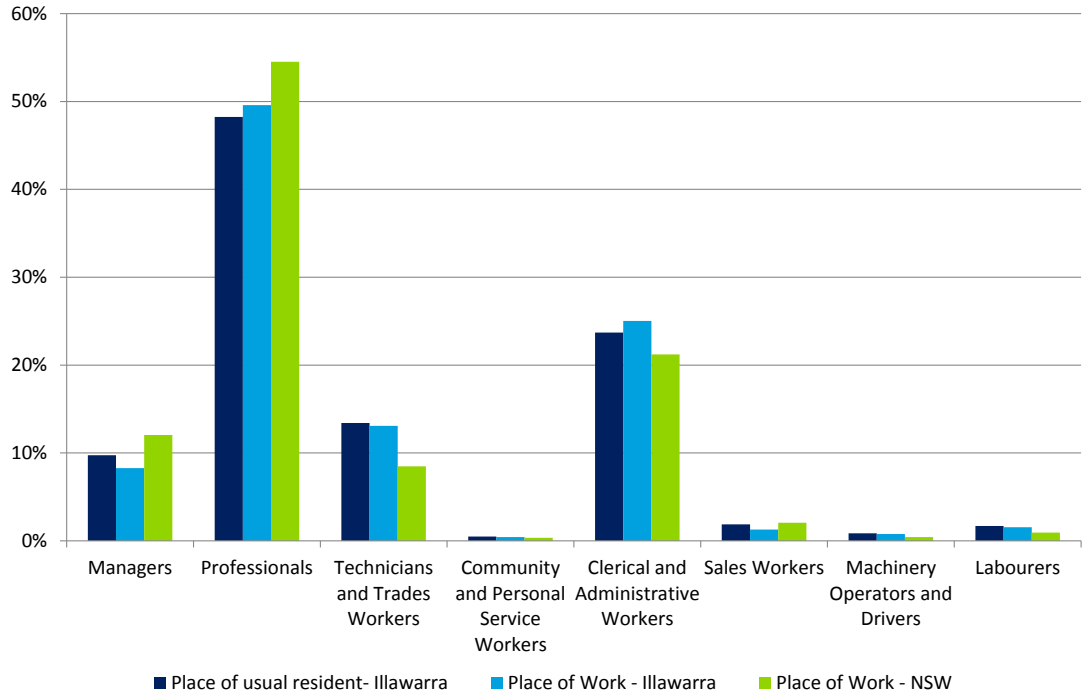
As with professional services the data suggests that the Illawarra region is 'exporting' managers - i.e. the proportion of managers with Illawarra as their usual place of residence exceeds the proportion whose place of work is the Illawarra. This indicates that some

managers in the health care sector who live in the Illawarra work outside the region in other areas such as Sydney.

As for the professional services sector, if the health care sector in the Illawarra expands, the number of managers leaving the region for work may fall and some new managers may find work in the health care sector in the region.

This health care sector in the Illawarra also employs relatively more community and personal service workers than NSW as a whole (see Chart 6.12).

Chart 6.12: Health care and social assistance labour profile



Source: ABS Census 2011

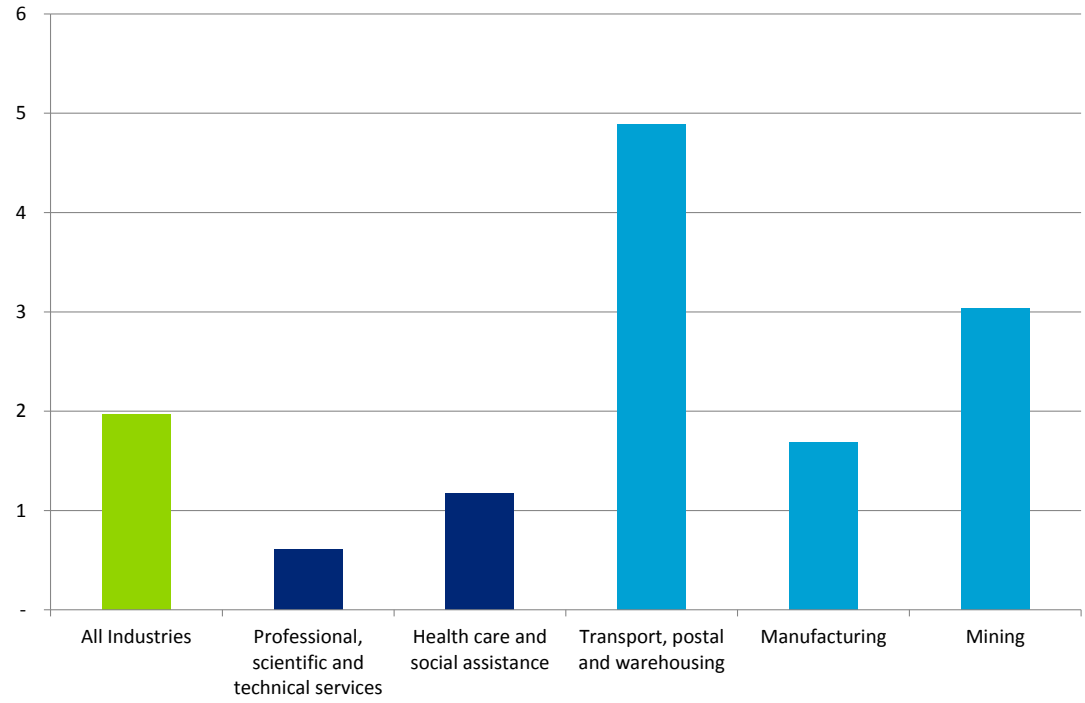
The health care and social assistance sector seems to also face some difficulties with skill mismatch in the region. First, the PEA survey suggests that registered nurses were one of the most difficult vacancies to fill in the region. The average number of applicants per vacancy was 7.6, however the average number of suitable applicants was 2.4. This highlights the extent of skill mismatch for community and personal service workers in the region and the need for further training of local workers, particularly as demand for aged care rises with an ageing population.

6.5 Capital intensity

The preceding sections have analysed the labour requirements and the intermediate inputs of each sector. To complete this analysis we will now examine the capital intensity of these sectors.

Capital is combined with labour to produce output.[8] To estimate capital intensity we measure the amount of capital required to create a unit of value added by the sector. Using this ratio we find that for all industries, $1.96 million of net capital stock is required to create every $1 million of gross value added. For health care and social assistance the ratio is 1.17, which implies $1.17 million of net capital stock is required to create $1 million of gross value added and for professional services the ratio is 0.61. A summary of these findings is presented in Chart 6.13.

Chart 6.13: Net capital stock per $1m of gross value added



Source: ABS 5204.0

Professional services and health care and social assistance are relatively less capital intensive than other sectors of the economy. For example mining requires around $3.04 million for every $1 million of gross value added and transport requires $4.88 million for every $1 million of gross value added.

However, though the level of capital intensity is lower, capital is still important for the production of the goods or services in the sector. For the health and social assistance sector there is little doubt that advanced medical equipment is required for the diagnosis and

[8] Capital can be both tangible – dwellings, machinery and equipment – and intangible – research and development, human capital.

treatment of illnesses. For professional services, though digitisation and teleworking is a trend that will influence the sector, there is little doubt that commercial real estate is still required to ensure that their services can be delivered.

It is worth noting that professional services are a key intermediate input for many sectors of the economy, the growth in which reflects the general trend of outsourcing and off-shoring. In many cases functions that are currently performed by the professional services sector used to be performed in-house by firms that demand their service. The next section highlights how professional services inputs can act as a catalyst for increasing value added by other industries and in nurturing entrepreneurship.

6.6 The indirect impact of professional, scientific and technical services

6.6.1 Adding value across the economy

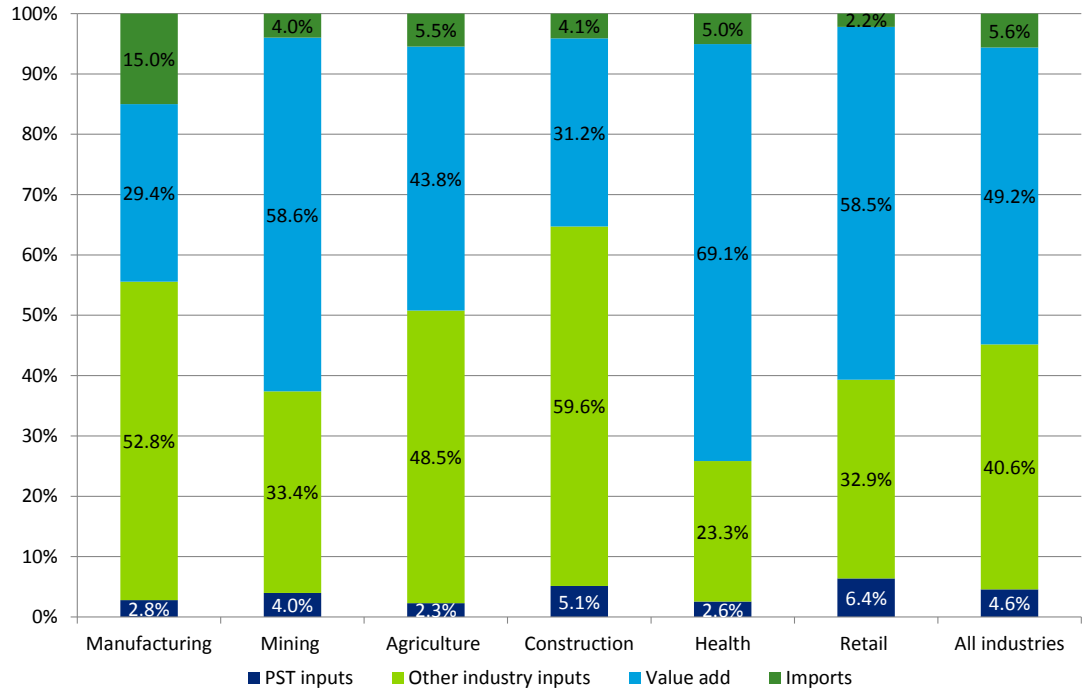
The key characteristic of professional services is that it is not so much a consumer industry, but that it contributes to the performance of industries elsewhere, including traditional industries in the Illawarra such as manufacturing and mining. For example, these services may include a marketing strategy which helps improve profitability for a manufacturer; the services of an accountant to minimize the tax bill for a mining company; or an engineering firm providing valuable insights into mine construction.

Below we will examine the contribution of inputs by the professional services sector to key industries relative to their total output. The specific industries which we consider are:

- Manufacturing;
- Mining;
- Agriculture;
- Construction;
- Health and social services; and
- Retail trade.

Across all industries we note that professional services inputs constitute about 4.6% of total output, or around $113 billion in Australia. A summary of the findings is presented in Chart 6.14.

Chart 6.14: Professional services components of Australian production by industry



Source: ABS 5209.0 2009-10

Chart 6.14 suggests that professional services inputs make up 2.8% of total output in manufacturing, 4.0% of total mining output and 5.1% of total construction output. Though proportionally small, if we consider the dollar value of each industry's production this translates to $10.5 billion in inputs for manufacturing, $6.5 billion in inputs for mining and $16.1 billion in inputs for construction in Australia. These are significant figures given the total industry use of professional services in Australia is $113 billion.

There is significant potential for professional services to expand as other sectors expand. The potential for non-Illawarra firms to outsource their back office support functions would also increase. Indeed, one way to encourage the growth of the Illawarra's professional services sector would be to position itself as a hub for 'back office type' work. And, in the future, high speed broadband will mean the potential for the Illawarra to do just that will be significantly enhanced.

6.6.2 Entrepreneurship

In addition to adding value, professional services cultivate and support entrepreneurship.[9]

In 2009, Professor Roy Green investigated Australian management practices and benchmarked them against global benchmarks. Green found,

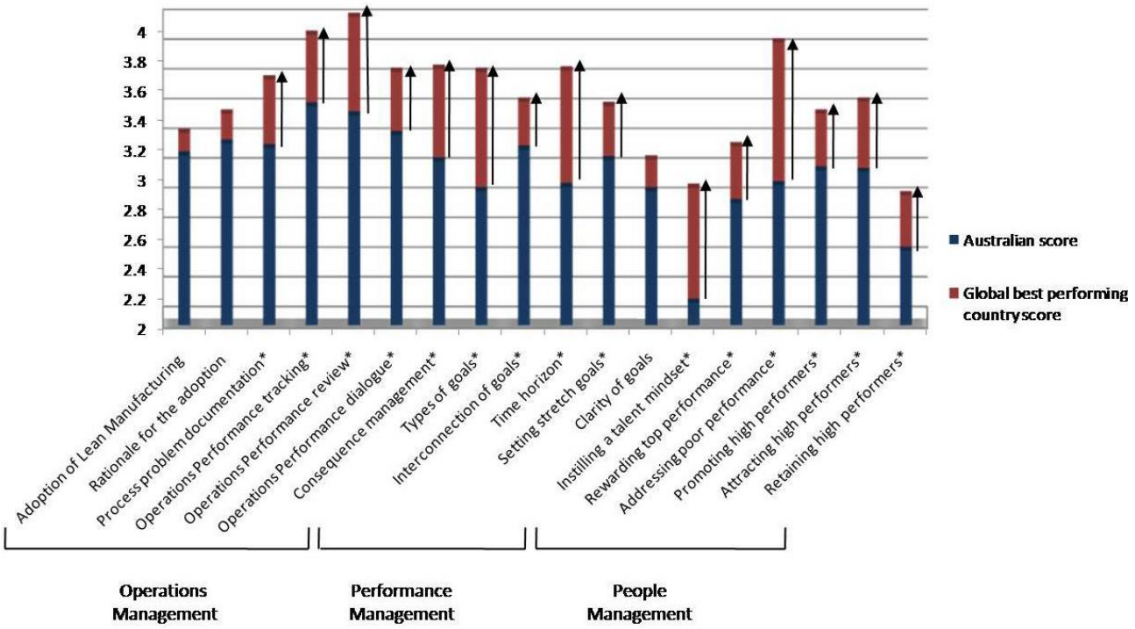
> *"A key finding of our research is that focussing on the critical mass of poorly managed manufacturing firms within the country is the most effective way of enhancing*

[9] According to Professor Howard Stevenson, Entrepreneurship is defined as, "the pursuit of opportunity beyond resources controlled" (Eisenmann 2013).

Australia's overall management capability and performance. Many Australian enterprises are stronger in operations management than people management. While they are able to link employee performance with clearly defined accountability and rewards, they lag in their deployment of advanced people management practices. These include attracting, developing and retaining talent, and identifying innovative but practical ways of developing human capital to improve performance and add value to organisations. To improve, Australian managers must give more attention to building their people management skills and the relationships within their organisations."
(Green, 2009)

These gaps are summarised by the chart below.

Chart 6.15: Gaps in the Australian management performance by each dimension



Source: Green (2009)

Given these gaps, professional services firms can assist entrepreneurship in two ways.

First, professional services firms can help entrepreneurs think about the problems they are facing from a different perspective. This will assist them in defining the types of goals they have in mind and the interconnection of these goals. This may range from formulating the correct incentive to drive performance and/or defining the appropriate goals to pursue in the market.

For example, consulting services can help retailers understand their customers through market research. By doing this research it helps them define the customers and the relationship of their product to their customers. Another example is that they can help manufacturing firms review the risk of ambitious projects. By bringing a second perspective to the problem, professional services may assist the entrepreneur to identify key opportunities which they may otherwise have missed.

The second mechanism through which professional services can help entrepreneurship is by carrying out managerial tasks that might otherwise be left to the business leader and take away from entrepreneurship opportunities. Especially in small businesses, where the business owner may also be responsible for many service functions, professional services may assist in freeing up a business leader's time by performing services such as accounting, consulting, marketing, etc., all of which may allow the business leader to be more entrepreneurial. In this way, the value created through entrepreneurship will not be captured in the traditional value chain.

7 Conclusions

This report has provided analysis of a range of issues which will affect the economic future of the Illawarra region. In particular there has been a focus on:

- competitive analysis to consider how the Illawarra economy may be affected by key broader economic and social trends;
- an analysis of the region's future workforce profile (based on identified trends);
- a review of key infrastructure requirements; and
- a supply chain analysis of the top two emerging and developing sectors for the region.

A number of opportunities exist to support economic development in the Illawarra region.

Many of these will continue to revolve around traditional areas of strength for the region in mining, manufacturing and transport.

But over time the region has also been undergoing structural change, and this is likely to continue to occur, with a greater proportion of activity being devoted to sectors such as health care, education and training, professional services, finance, and hospitality.

In many cases, growth opportunities are being led by smaller firms rather than established players, many growth opportunities are being enabled by changes in technology (digital disruption), and opportunities are likely to have rising skill requirements over time (and hence the importance of tertiary education).

The Illawarra region's proximity to Sydney is also a defining feature – one which should be embraced for economic development purposes, not shunned.

The region's continued economic development can be supported by harnessing the 3Ps of population, participation and productivity – the building blocks of economic growth:

- Encourage **population** movement to the Illawarra region through affordable housing, lower costs for business and good infrastructure.
- Encourage **participation** in the labour force by improving skill levels, providing assistance for redeployment from declining sectors, and providing more opportunities for University alumni to remain in the region.
- Encourage **productivity** growth by harnessing the region's natural advantages via Port Kembla, niche manufacturing, tourism, and excellence in health care driven by the region's demographic profile.

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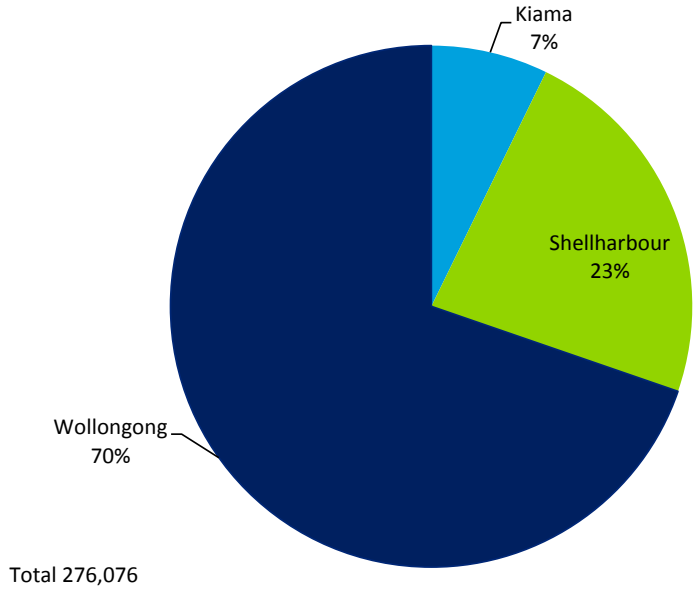
Appendix A: Population structure and trends

The population today

At the 2011 Census the Illawarra region had a total population of 276,000 people, approximately 4% of the total New South Wales (NSW) population. The Illawarra's contribution to State population has remained relatively stable since the early- to mid-1990s. Some 70% of the region's population resides in Wollongong. A further 23% live in the other main urban area of Shellharbour, while 7% live in the smaller community of Kiama.

Chart A.1: Population by Local Government Area



Source: 2011 Census

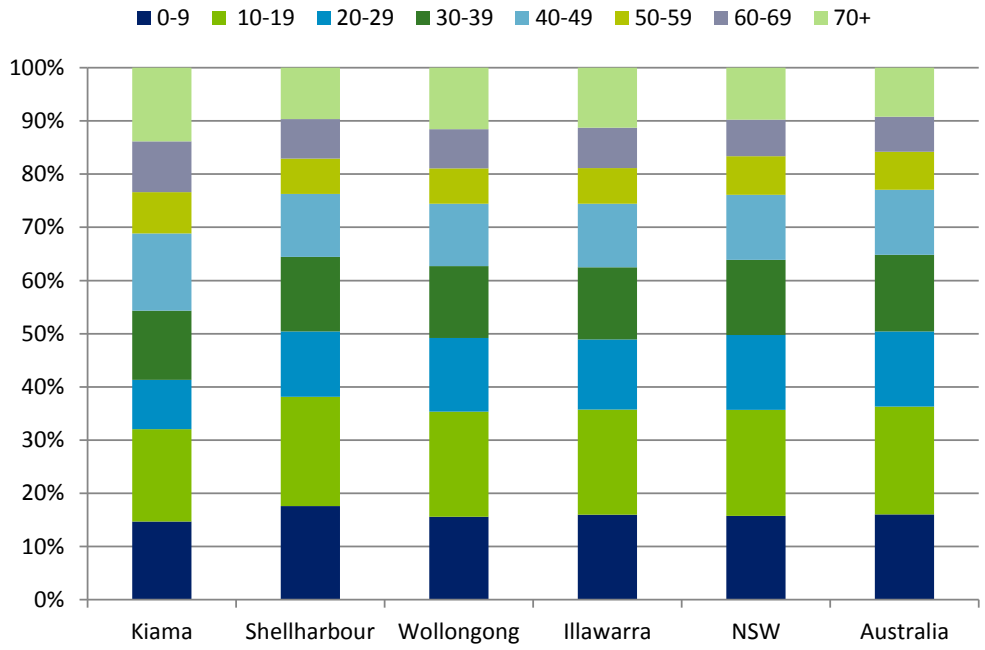
Given its close proximity to Sydney and its natural attractions, it is perhaps unsurprising that the population of the Illawarra region has a relatively older age profile compared to the State and national averages.

Overall, some 19% of the Illawarra's population is aged over 60, compared to 17% of the New South Wales population and 16% of the Australian population. Similarly, a slightly smaller share of the Illawarra's population is less than 30 years old - 48.9% in the Illawarra, compared to 49.7% of the New South Wales population and 50.4% of the Australian population.

Within the Illawarra region, just over half of the Shellharbour population is aged under 30 years, and only 17% of its population is aged 60 years and over. As a popular retirement

destination, Kiama has a relatively older population – nearly a quarter of its residents are aged 60 years and over, and only 41% are under 30 years. Wollongong's age profile is similar to Shellharbour's, with 49% of its population under 30 years and 19% aged 60 years and over.

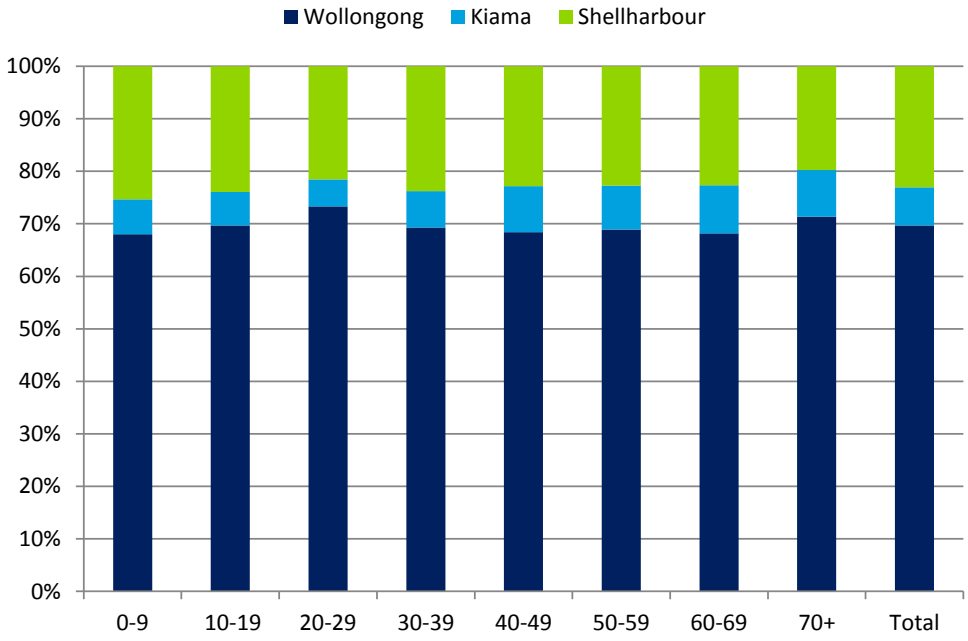
Chart A.2: Age distribution of population



Source: 2011 Census

Each area's age profile is consistent with its degree of population density. The relatively urbanised areas of Shellharbour and Wollongong (with a population density of 450 persons and 294 persons per square kilometre respectively) have a relatively younger demographic. The lower density Kiama LGA has a relatively older demographic.

Chart A.3: Regional distribution of population

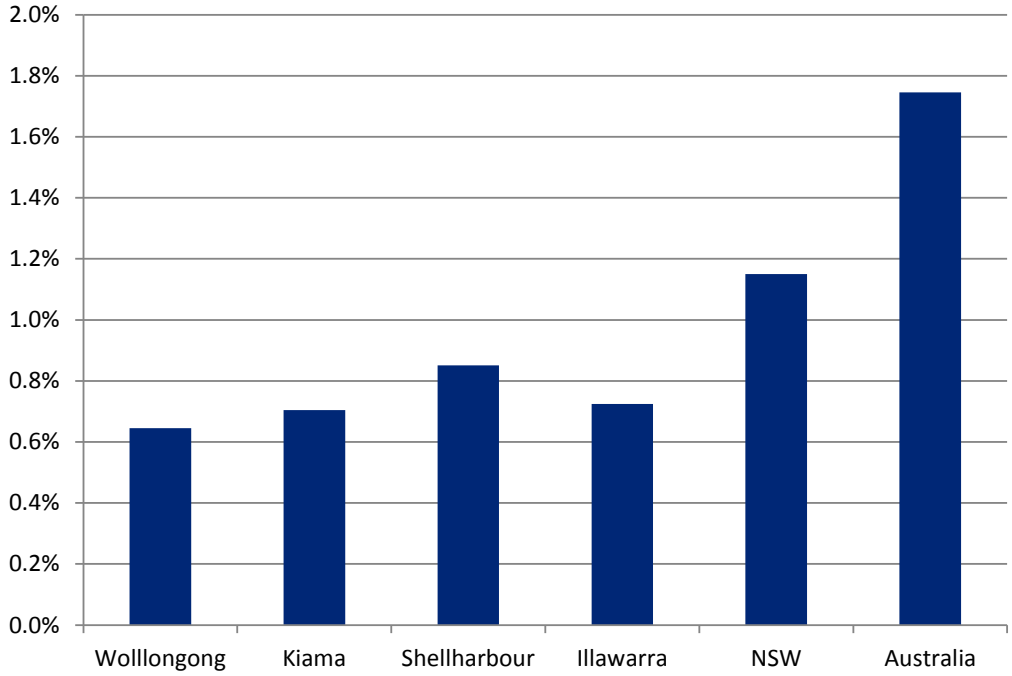


Source: 2011 Census

Population trends

The Illawarra region recorded average annual population growth over the five years to 2011-12 of 0.6%. That compares to growth of 1.2% in New South Wales and 1.7% in Australia. Though all areas within the Illawarra recorded population growth below the State average, the fastest growing area was Shellharbour, with average annual growth of 0.9%, followed by Kiama (0.7%) and Wollongong (0.6%).

Chart A.4: Population growth by region, 2006-07 to 2011-12



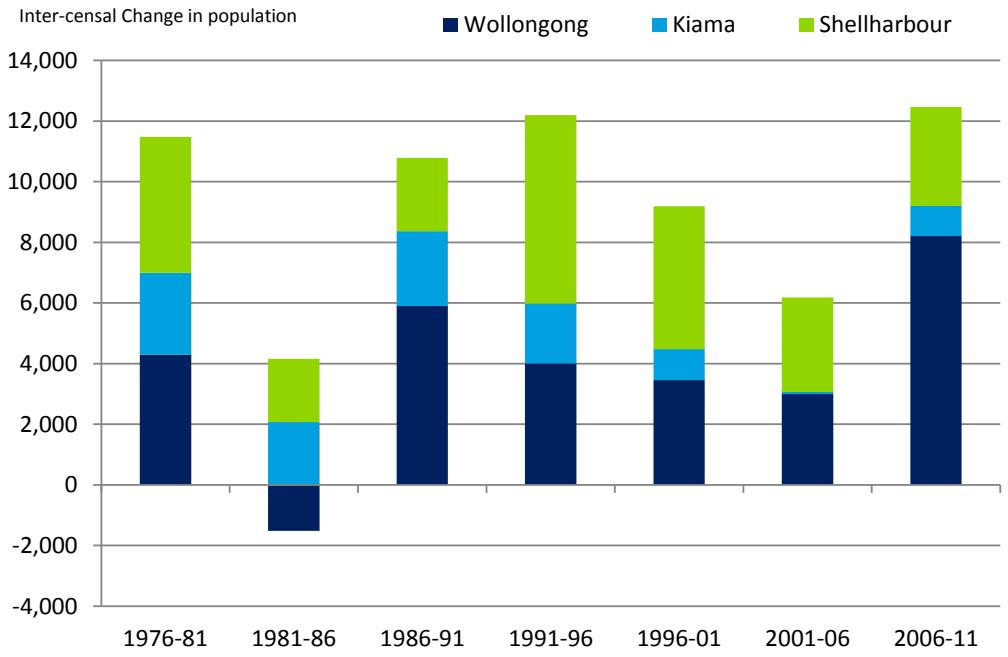
Source: ABS 3218

Although it is the most populous area in the Illawarra, Wollongong's share of the Illawarra's population has gradually declined over time. It accounted for 78% of the region's population in 1976 compared with 70% at the 2011 Census.

Chart A.5 shows the absolute population growth for the three LGAs in five year periods between the 1976 Census and the 2011 Census. From the mid-1970s until the mid-1990s, Shellharbour recorded the largest absolute increase in population in the Illawarra region of approximately 15,000 people. Meanwhile, Kiama's population growth has moderated over time. In the 1980s its population was growing by around 2,500 people every five years, but now that figure has declined to only about 1,000.

Wollongong has experienced a difficult and extended period of structural adjustment over time, particularly in relation to the decline of the region's manufacturing base, which has also had implications for population growth. For example, the decline in Wollongong's population between 1981 and 1986 in part reflects the layoff of 2,500 workers at the Port Kembla steelworks in 1982 (Donaldson & Donaldson, 1983).

Chart A.5: Regional population growth, five yearly intervals, 1976-2011

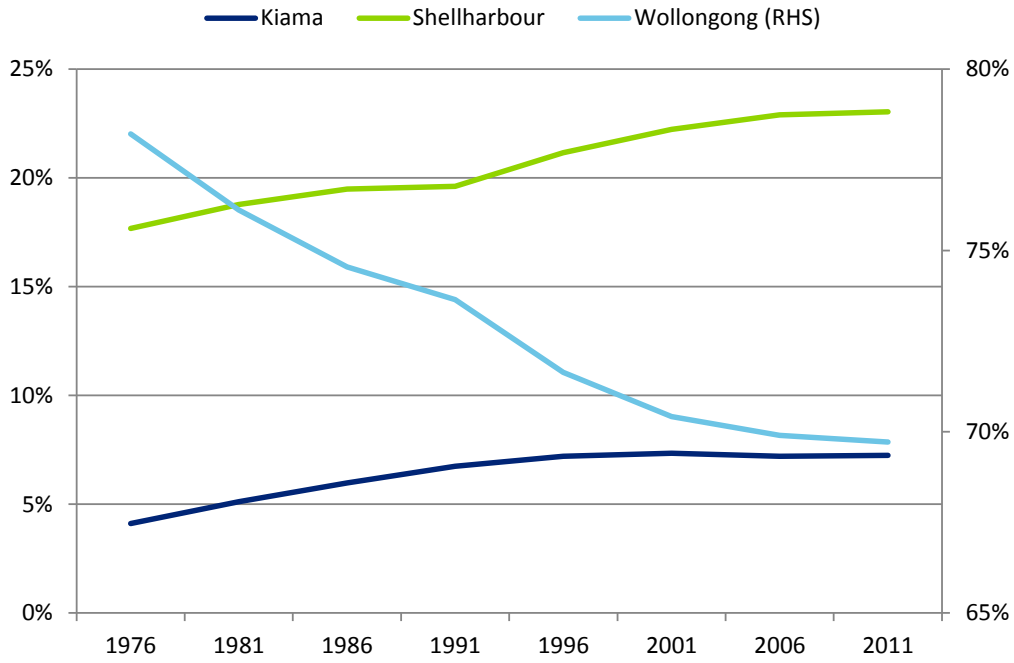


Source: Census data, 1976-2011

Note: Pre-1996 data are by place of enumeration (where people were on Census night); data from 1996-2011 are by place of usual residence (where people lived).

Following on from the above, Chart A.6 shows how the Illawarra's population growth has been distributed into its three LGAs from 1976 to 2011. It highlights the decline of Wollongong's population share to the benefit of Shellharbour and Kiama.

Chart A.6: Areas' share of Illawarra population, 1976-2011

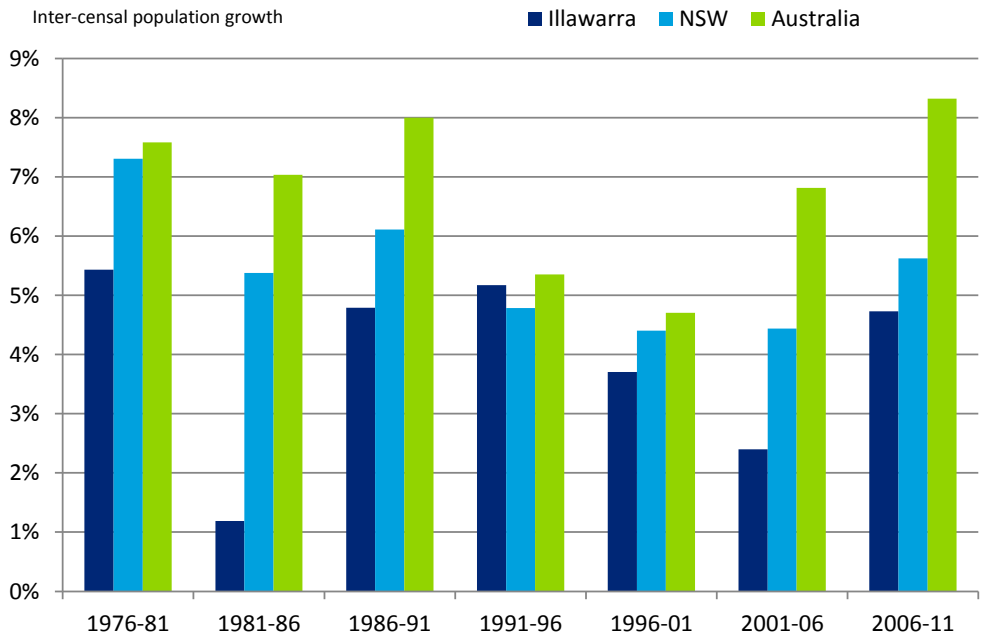


Source: ABS 3218

Chart A.7 compares population growth from 1976 to 2011 in the Illawarra region with the totals for New South Wales and Australia. The chart shows that the Illawarra's relatively slow population growth has been consistent over a long period. In part this reflects the significant structural change the region has experienced over an extended period. Indeed, as noted above, large scale manufacturing layoffs around Port Kembla happened as early as 1983.

Population growth picked up slightly in the most recent inter-Censal period to almost 5% but remains well below both the State and national averages.

Chart A.7: Population growth through time, Illawarra, NSW and Australia



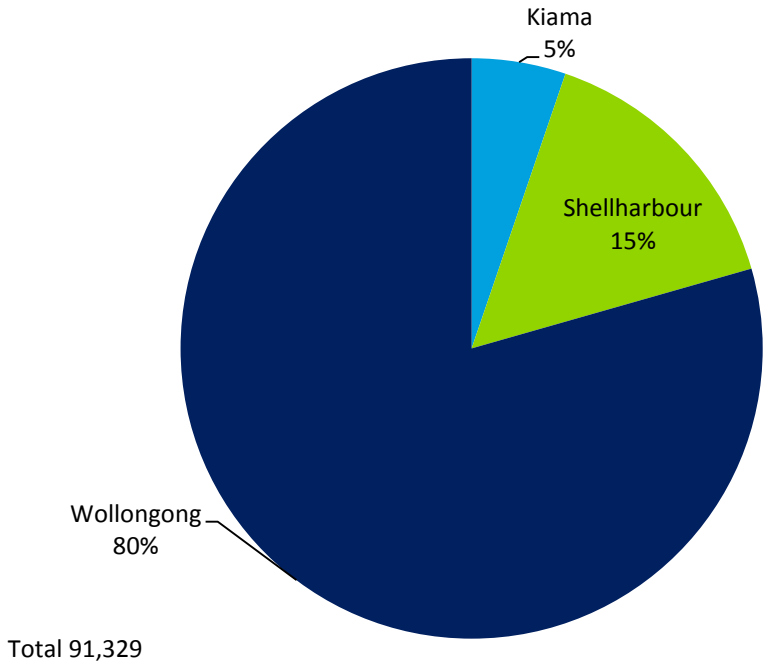
Source: Census data, 1976-2011
Note: Pre-1996 data are by place of enumeration; 1996-2011 are by place of usual residence

Appendix B: Workforce structure and trends

The workforce today

Wollongong is the Illawarra region's 'capital city'. It is home to around 70% of the Illawarra's population, but employs 80% of its workforce. In other words, a number of employed residents in Shellharbour and Kiama commute to Wollongong for work.

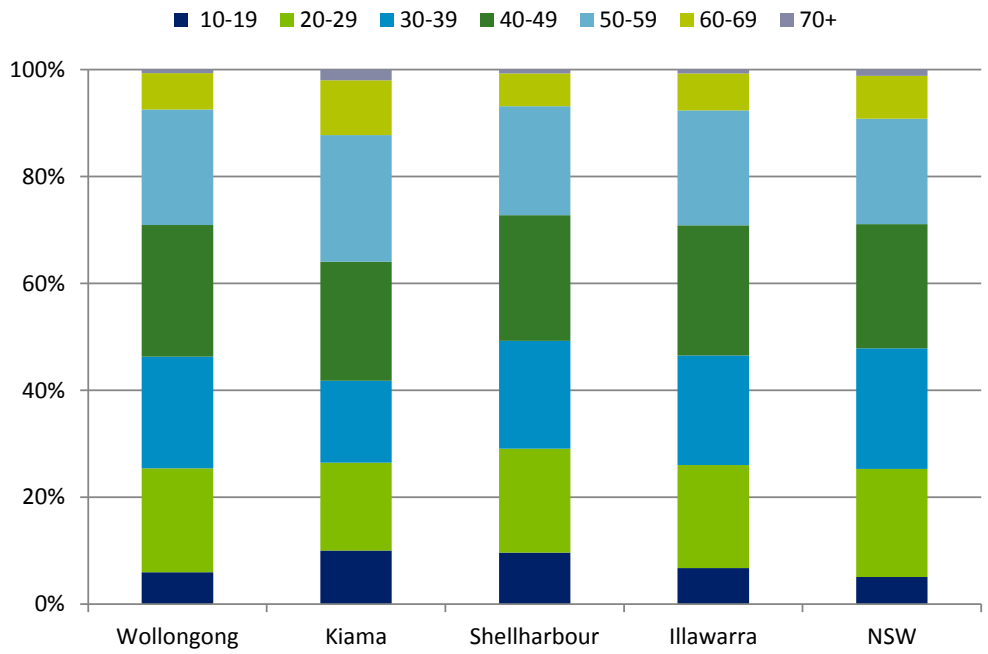
Chart B.1: Share of the workforce, 2011



Source: 2011 Census

Overall, about 29% of the workforce in both the Illawarra and New South Wales is aged 50 years and over. Within the Illawarra, Shellharbour has the highest share of workers younger than 30 years of age, at 29%, while Kiama has the highest share of workers 50 years and over, at 36%.

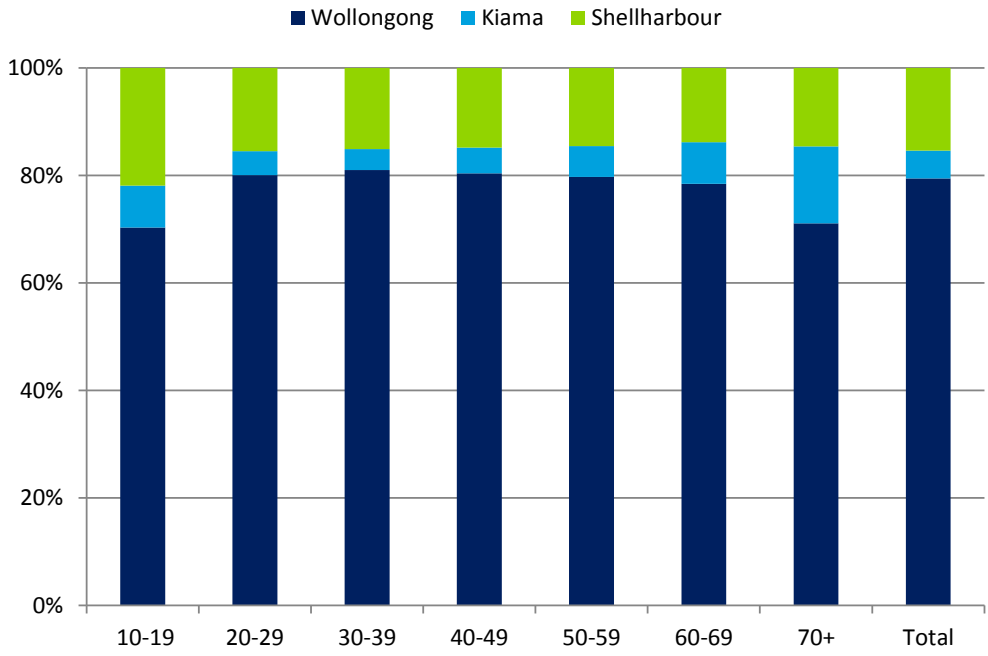
Chart B.2: Age distribution of workforce



Source: 2011 Census

Chart B.3 presents the same data as Chart B.2, broken up by age group rather than region. Shellharbour has 17% of the under 30 workforce, compared with 14% of the workforce aged 50 years and over.

Chart B.3: Location of workforce by age group



Source: 2011 Census

Wollongong has the majority of workers in all age cohorts, though its dominance tends to be concentrated around the prime working ages, with the younger and older workforces relatively more evenly distributed across the three LGAs. This may reflect an abundance of manufacturing and services jobs in Wollongong relative to Kiama and Shellharbour.

Unemployment and participation

At the time of the 2011 Census, the Illawarra region had a higher unemployment rate than both the State and national average, at 6.6%, compared to 5.9% for NSW and 5.6% for Australia. Within the Illawarra region, Wollongong has the highest rate of unemployment, at 7.0%, and Kiama the lowest, at 4.4%. Across most age cohorts, the unemployment rate in Wollongong is slightly higher than in Kiama and Shellharbour.

Unemployment data for this project have been taken primarily from the 2011 Census. The corresponding estimates from the Labour force Survey for the Wollongong SRS are consistent with the rate implied by the Census data, at 6.8% for 2010-11, and 6.9% for 2011-12.

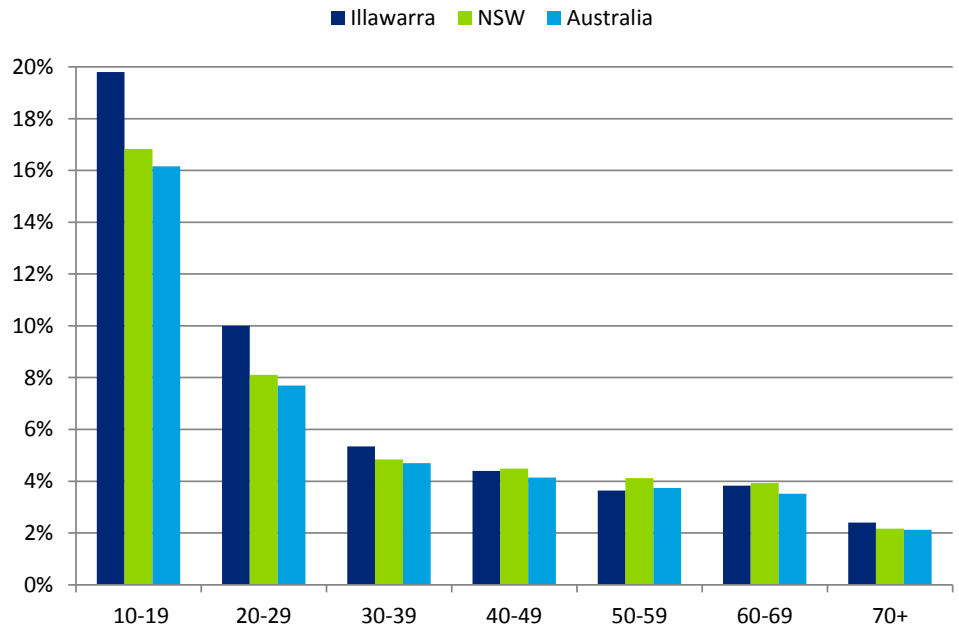
Table B.1: Age specific unemployment rates

	Total	10-19	20-29	30-39	40-49	50-59	60-69	70+
Wollongong	7.0%	20.0%	10.6%	5.5%	4.6%	3.7%	3.7%	2.9%
Shellharbour	6.7%	21.5%	9.1%	5.1%	4.3%	3.7%	4.1%	0.0%
Kiama	4.4%	12.9%	5.7%	4.0%	3.1%	2.7%	3.9%	2.0%
Illawarra	6.7%	19.8%	10.0%	5.3%	4.4%	3.6%	3.8%	2.4%
NSW	5.9%	16.8%	8.1%	4.8%	4.5%	4.1%	3.9%	2.2%
Australia	5.6%	16.2%	7.7%	4.7%	4.1%	3.7%	3.5%	2.1%

Source: 2011 Census

Chart B.4 highlights the gap between Illawarra, NSW and Australian unemployment rates for each age group presented above. It shows that despite matching the State average for some key age cohorts (namely 40 to 59 year olds), the unemployment rate in the Illawarra is considerably higher than the State and national averages. In particular, a higher unemployment rate across younger cohorts is causing a gap of almost one percentage point between the overall unemployment rate in the Illawarra compared New South Wales as a whole.

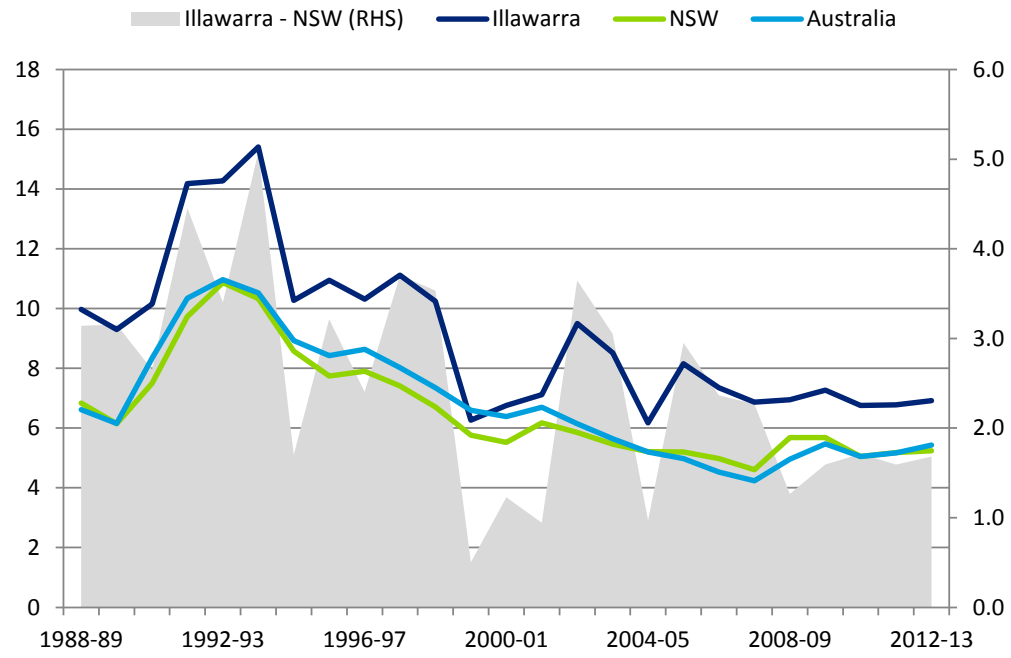
Chart B.4: Age specific unemployment rates, Illawarra, NSW, Australia



Source: 2011 Census

As shown in Chart B.5, the Illawarra's unemployment rate has been higher than the State average since the late 1980s (from when consistent data are available). That said, the absolute difference between the Illawarra and NSW unemployment rates – as shown by the grey shaded area on the right hand axis of Chart B.5 – has been trending down gradually over the past two decades.

Chart B.5: Unemployment rate through time, Illawarra, NSW and Australia

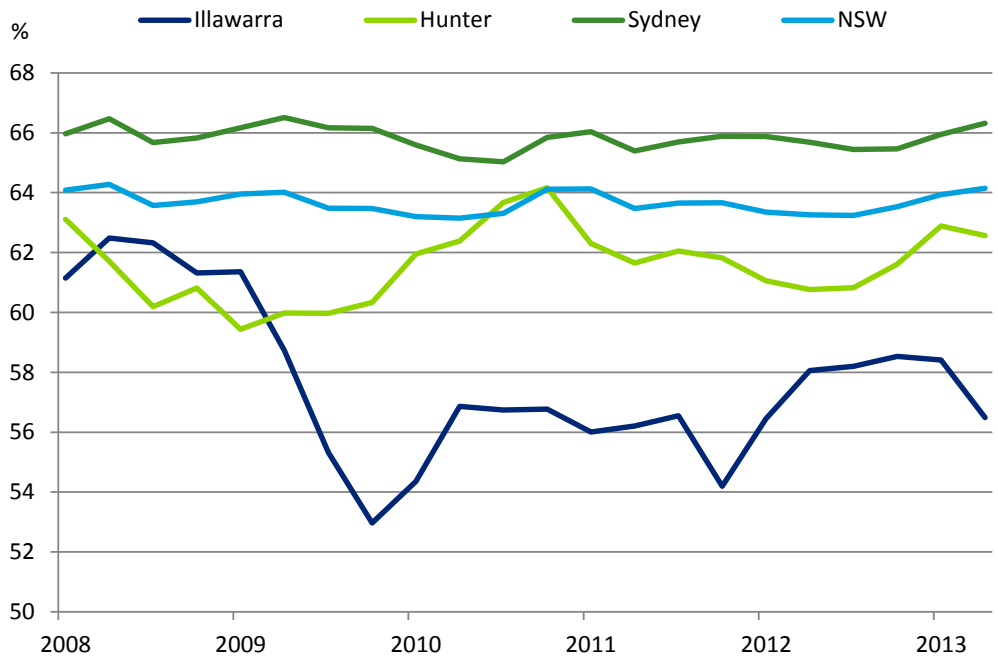


Source: ABS Labour Force Survey

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force survey should be interpreted with caution due to small sample sizes.

As seen in Chart B.6, the labour force participation rate in the Illawarra region is currently around 57%, one of the lowest rates across NSW.

Chart B.6: Labour force participation rate by region



Source: ABS Labour Force Survey

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force survey should be interpreted with caution due to small sample sizes.

Underemployment

Underemployment occurs when the level or quality of work available is insufficient for the worker. In the context of this report, underemployment refers to a situation where an individual is working, but would prefer to work more hours. Overall, about one quarter of part time workers in New South Wales indicate that they would prefer to work more hours.

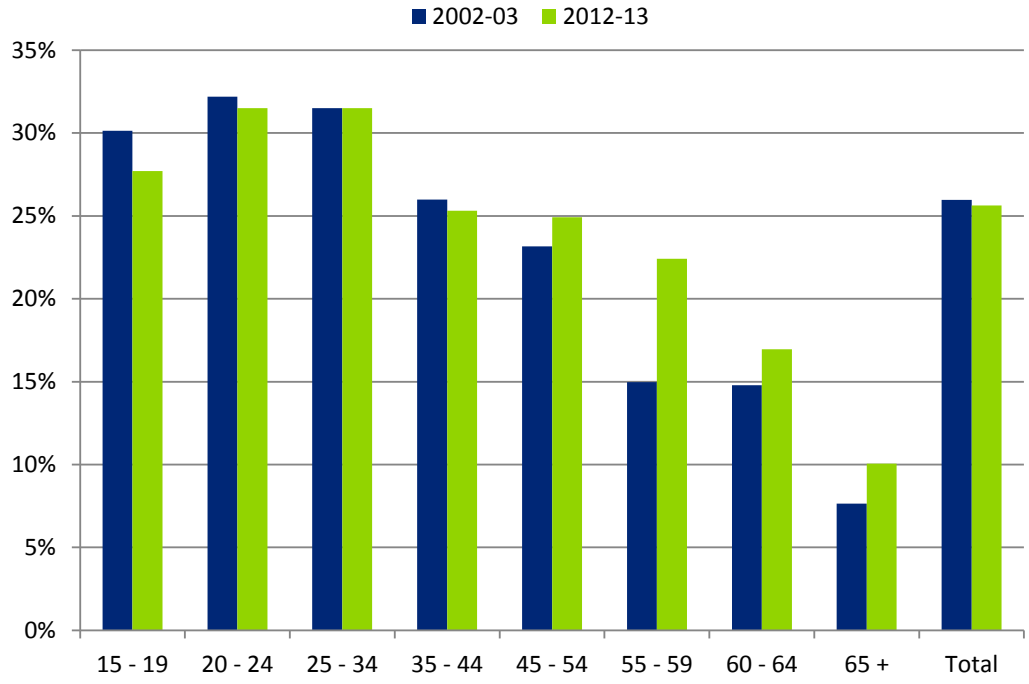
The rate of underemployment tends to move in line with the economic cycle, rising during periods of softer labour demand and higher unemployment, and falling during periods of stronger labour demand. Underemployment among younger age cohorts tends to show far more cyclical volatility than among the older age cohorts, reflecting a general trend for older individuals to be more comfortable with part time work. By contrast, younger part time workers tend to be those working in industries with a large part time and casual workforce (such as retail), and may well want to work additional hours.

Over the past ten years there has been a shift in the age distribution of underemployment in NSW. Specifically, the underemployment rate of younger workers (defined as the proportion of part time workers who indicate that they would prefer to work more hours if

they had the choice) has fallen modestly, while the underemployment rate of older workers has risen. Most significantly, the underemployment rate of 55 to 59 year olds rose from 15% in 2002-03 to 22% in 2012-13.

The significant rise in underemployment rates across the older age cohorts gives one indication of the extent to which the economic conditions since the global financial crisis have affected the confidence of those nearing retirement age, with part time work perhaps being increasingly viewed as insufficient.

Chart B.7: Share of part time workers who want to work more hours, NSW



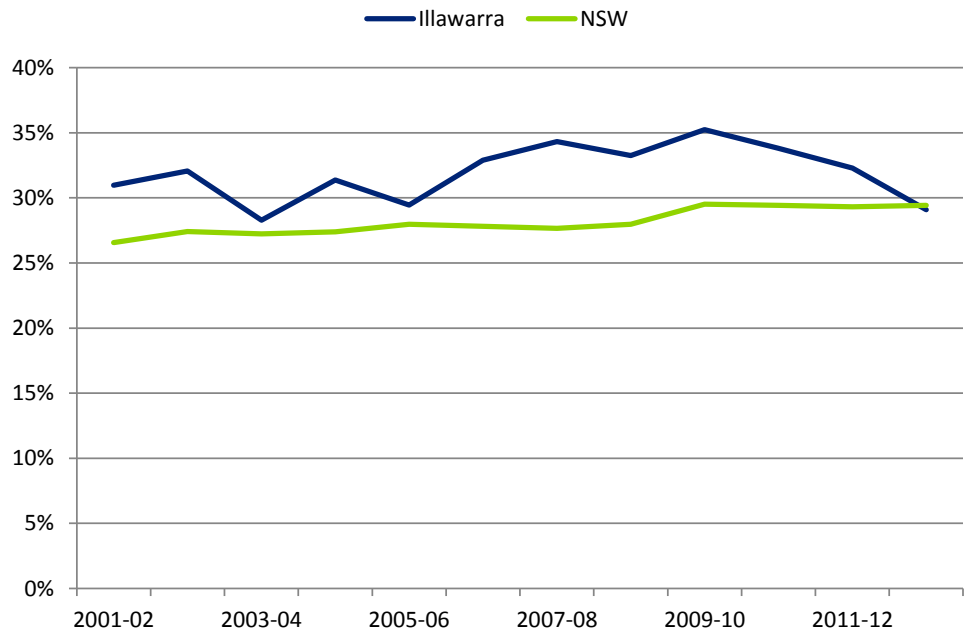
Source: ABS Labour Force Survey

Though specific data is not available, it may be the case that the issue of underemployment is more pressing in the Illawarra region than in NSW as a whole:

- Despite the share of part time employment in the Illawarra declining in recent years, the Illawarra's workforce has traditionally been more part time intensive than for NSW as a whole (Chart B.8)
- Anecdotal evidence[10] suggests that the large scale manufacturing layoffs in the area have caused many previously full time employees to seek part time jobs, often interstate
- As noted in the previous chapter, the Illawarra has a relatively older population than other regions, and underemployment among older cohorts in NSW has been rising in recent years.

[10] See, for example, http://illawarranews.blogspot.com.au/2013/08/throsby-candidates-prepare-for-public.html#!/2013/08/throsby-candidates-prepare-for-public.html

Chart B.8: Part time share of workforce, Illawarra v NSW



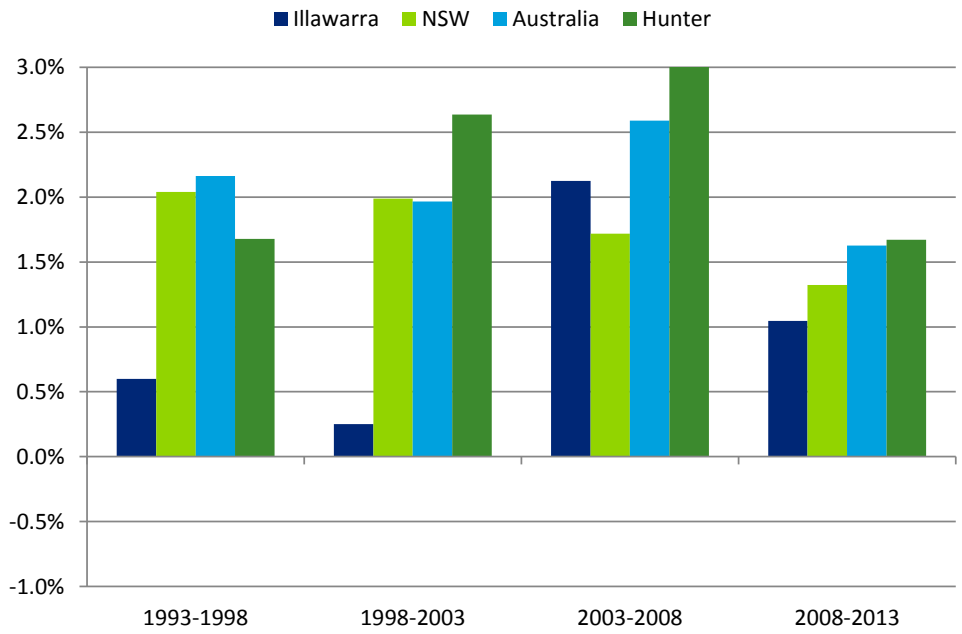
Source: ABS Labour Force Survey

The workforce over time

As is discussed below, the Illawarra region bears strong similarities to the Hunter region to the north of Sydney in terms of size, and industry and occupational composition. However, as shown in Chart B.9, growth of the Illawarra's labour force has lagged behind other regions, particularly the Hunter.

The very low growth rates recorded over the decade to 2003 reflect challenging economic conditions, including for the region's manufacturing base. Based on economic reports published at the time (see for example IRIS, 1997), this likely reflects deterioration in manufacturing conditions around the time of the Asian Financial Crisis, as well as the completion of some large development projects in the year prior.

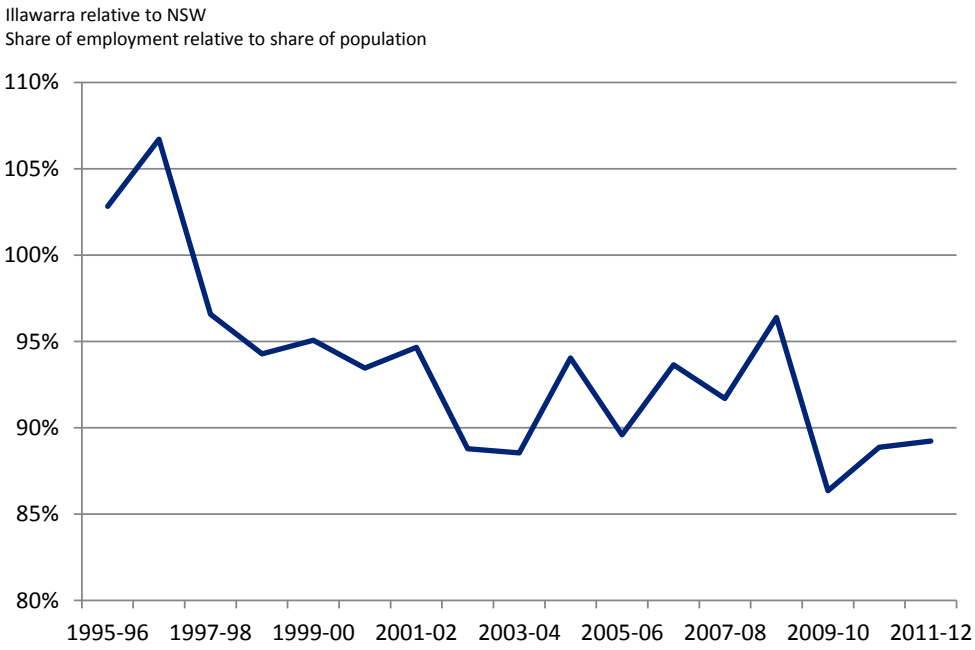
Chart B.9: Average employment growth over time



Source: ABS Labour Force Survey

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force survey should be interpreted with caution due to small sample sizes.

Chart B.10: Contribution to employment relative to population



Source: ABS Labour Force Survey and 3218

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force survey should be interpreted with caution due to small sample sizes.

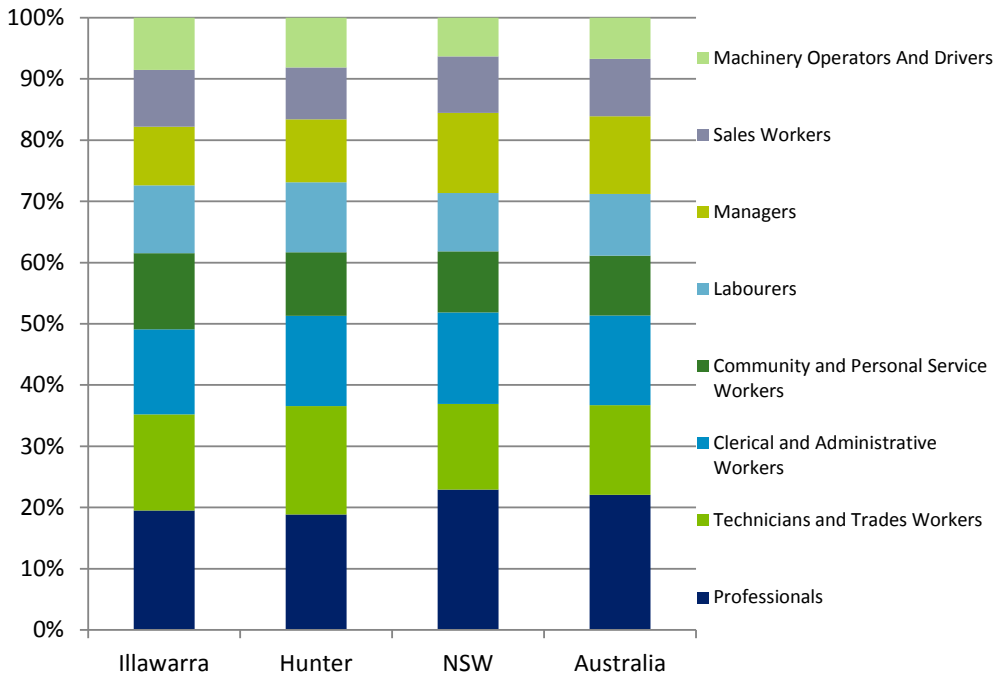
Chart B.10 shows the Illawarra region's share of NSW employment relative to its share of population. A ratio less than 100% implies the Illawarra region makes a smaller contribution to the State's workforce than it does to its population. Since the late 1990s the ratio has consistently been less than 100%, reflecting the relatively low labour force participation rate in the Illawarra.

The fall in the regional employment-to-population ratio in Chart B.10 between 1996 and 2000 corresponds with a period of slow employment growth relative to somewhat faster population growth.

Occupational structure

The occupational structure of the Illawarra's workforce is presented in Chart B.11 below. This should be considered in conjunction with the information on industry structure, which is discussed later in Appendix C.

Chart B.11: Workforce composition by occupation



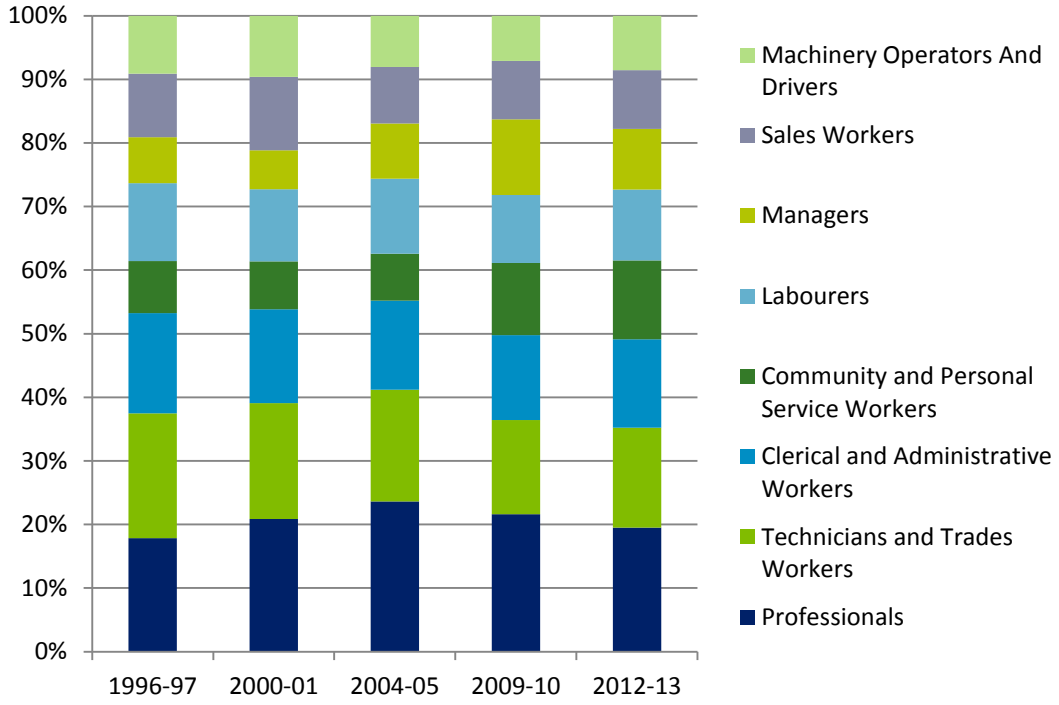
Source: ABS Labour Force Survey

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force survey should be interpreted with caution due to small sample sizes.

In brief, the Illawarra's workforce is comprised of a relatively higher share of 'blue collar' occupations such as labourers and technicians, than of 'white collar' occupations such as professionals and managers.

Overall, the Illawarra's occupational structure has not changed significantly over time. That said, some gradual change is evident in Chart B.12; technicians and trades workers accounted for 16% of the region's workforce in 2012-13, compared with 20% in 1996-97. Over the same period, the share of managers and community and personal services workers has increased gradually.

Chart B.12: Occupational composition through time



Source: ABS Labour Force Survey

Note: the 'Illawarra' in this chart refers to the Wollongong Statistical Region Sector, which is consistent with the RDAI's definition of the Illawarra. Small area data from the Labour Force survey should be interpreted with caution due to small sample sizes.

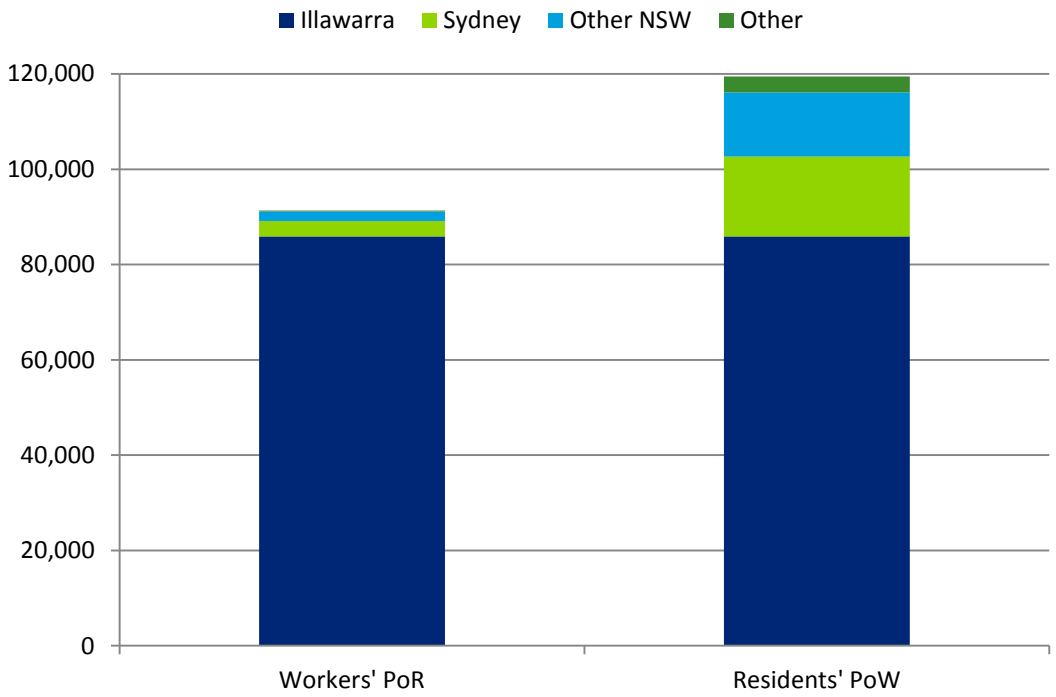
Journey to work

Some 94% of individuals who work in the Illawarra also reside in the region. A further 4% live in Sydney, while the remainder live in other NSW regions.[11] By contrast, only 72% of Illawarra residents who are employed actually work in the region.

In other words, almost 30% of employed people who reside in the Illawarra travel outside the region for work. Around half of these commuters work in Sydney, 40% work in other New South Wales regions, and 10% work outside New South Wales (primarily in the ACT, Queensland and Victoria). Given that the 'other NSW regions' category includes undefined responses (that is, the respondent did not indicate where they work), it is perhaps reasonable to conclude that the majority of people who reside in the Illawarra region but work elsewhere, work in Sydney.

[11] Census data also suggest a very small proportion of workers in the Illawarra region live in other States or Territories (0.2%).

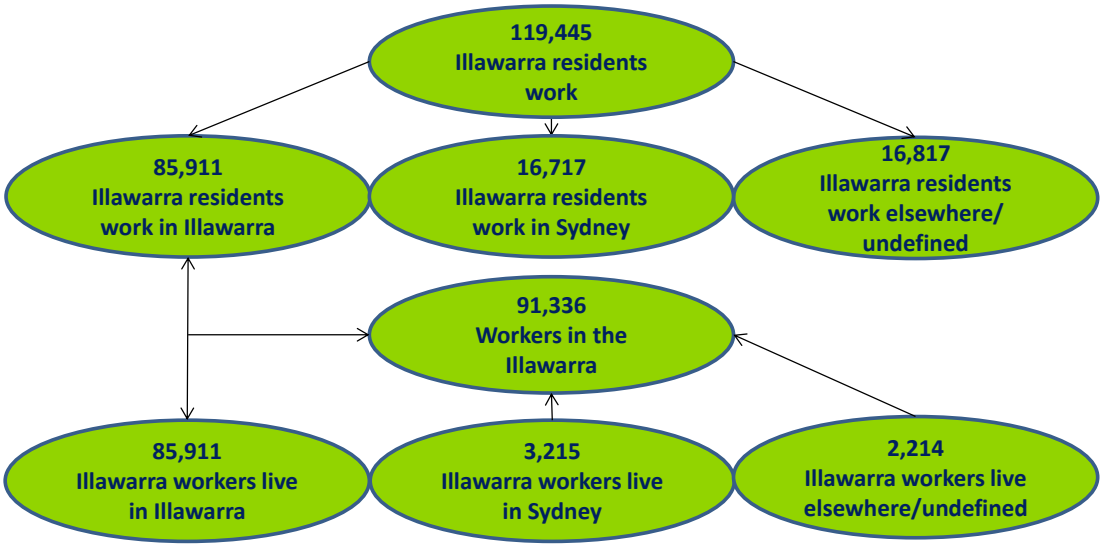
Chart B.13: Illawarra workers' place of residence and Illawarra residents' place of work



Source: 2011 Census

Figure B.1 shows the 'journey to work' for Illawarra workers and residents, and reconciles the number of employed residents (119,445) with the number of workers (91,336). The Illawarra region is very much a 'net exporter' of workers: it 'exports' some 33,000 workers to other regions (primarily Sydney), yet 'imports' only 5,500 or so workers from other regions (again, primarily Sydney).

Figure B.1: 'Journey to work' for Illawarra residents and workers



Source: 2011 Census

Table B.2: 'Exports' and 'Imports' of workers

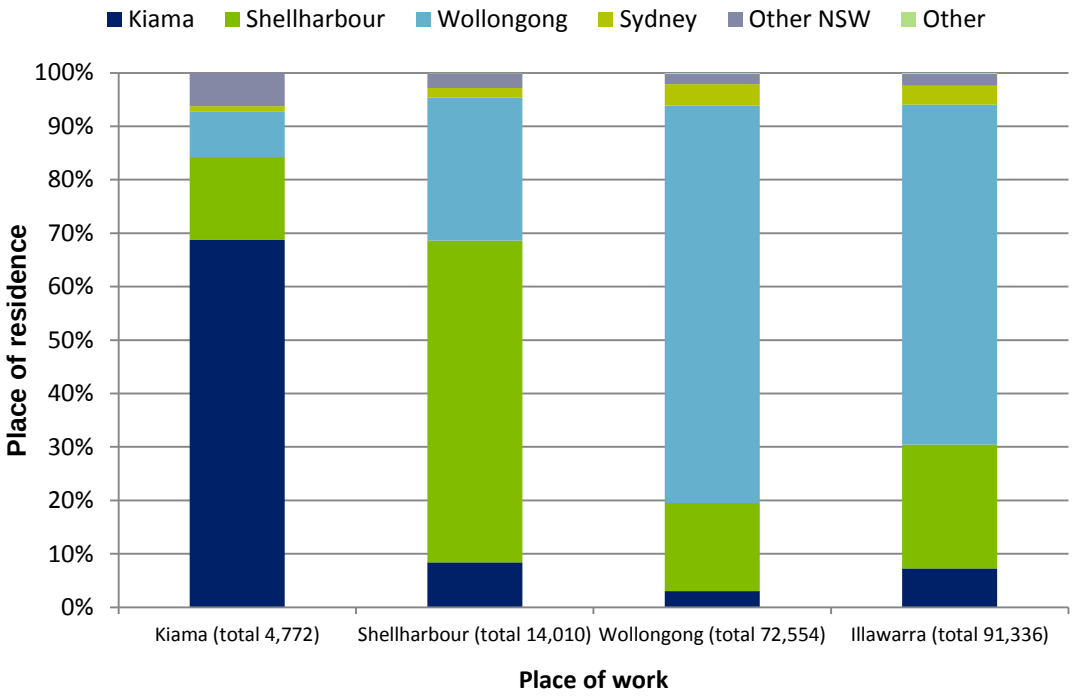
	Kiama	Shellharbour	Wollongong	Illawarra
Exports	5,907	18,974	28,917	33.534
Imports	1,493	5,578	18,619	5,429
Ratio	4.0	3.4	1.6	6.2

Source: 2011 Census

Note: The Illawarra total in this table is not comparable with the LGA figures since the latter include 'inter-regional' travel. Approximately 10,000 residents did not adequately record their address in the Census. In the absence of better information these workers are considered 'commuters' for the purpose of this analysis.

Although 80% of Illawarra workers work in Wollongong, only 64% of employed residents actually work in Wollongong. Wollongong 'exports' 29,000 workers (that is, 29,000 people live in Wollongong but work elsewhere) and 'imports' 19,000 workers. As shown in Table B.2, this trend is true of all the Illawarra regions. Overall, some 43,000 workers leave the Illawarra region every day for work, yet only 6,500 workers travel to the Illawarra every day for work.

Chart B.14: Workers' place of residence, by LGA



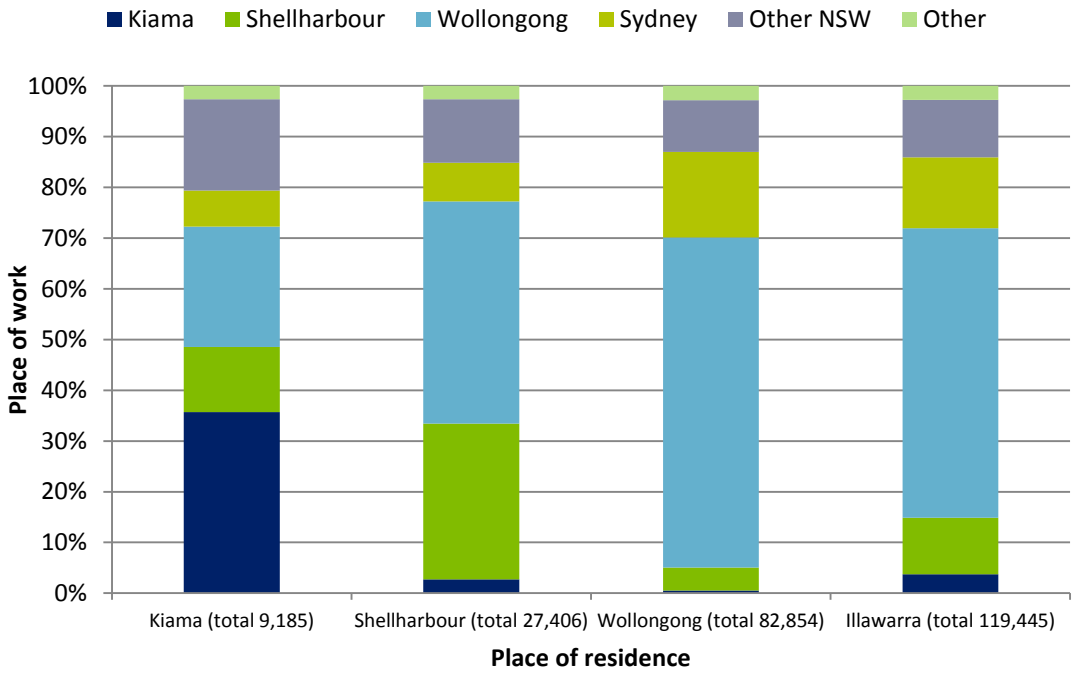
Source: 2011 Census

Chart B.14 and Chart B.15 together give an indication of the mobility of the workforce within the Illawarra.

Chart B.14 shows workers' place of residence at an LGA level. It shows both the extent to which each LGA imports workers as well as where it imports workers from. Shellharbour has the most mobile workforce within the region – only 60% of those who work in Shellharbour also live in Shellharbour.

Chart B.15 shows residents' place of work. Similarly, Shellharbour is home to the most 'mobile' workers – only 31% of Shellharbour residents who are employed work in Shellharbour, compared to 36% for Kiama and 65% for Wollongong.

Chart B.15: Residents' place of work, by LGA



Source: 2011 Census

As noted above, almost 30% of the Illawarra's 'potential workforce' – that is, Illawarra residents who are employed – commute outside of the region for work. That said, the region's position as a 'net exporter' of workers implies that some Sydney-based workers have decided to leave the city and instead reside in the Illawarra; this 'sea change' of Sydney-based workers will continue to provide opportunities for the region's economy going forward.

What jobs do the commuters do, and what sectors do they work in?

Around half of Illawarra residents who commute outside of the region for work commute to Sydney. Of those, over 70% work in three major areas: Inner Sydney (29%), St George-Sutherland (26%) and Outer South West Sydney (17%).

The 33,517 commuters presented in Figure B.1 are displayed in Table B.3, identified by place of work and occupation.

The table shows that commuters' occupations vary significantly according to which region they work in. Two-thirds of commuters to inner Sydney are 'white collar' (defined here as the sum of managers, professionals, and clerical and administrative workers) and only 20% are 'blue collar' (defined here as the sum of technicians and trade workers, machinery operators and drivers, and labourers).

By contrast, 53% of commuters who commute outside of Sydney are blue collar, and only 29% white collar. Overall, commuters' jobs are split relatively evenly between white collar (42%) and blue collar (40%).

Table B.3: Commuters from Illawarra - occupation by place of work

	Inner Sydney	St George-Sutherland	Outer SW Sydney	Rest of Sydney	Other NSW	Total
Managers	738	473	289	905	991	3,607
Professionals	1,441	965	861	1,209	1,812	6,647
Technicians and trades workers	580	717	531	736	3,445	6,573
Community and personal service workers	531	645	188	501	1,451	3,565
Clerical and admin. workers	952	622	156	530	926	3,402
Sales workers	225	331	99	326	959	2,144
Machinery operators and drivers	170	209	565	375	1,484	3,056
Labourers	173	298	128	252	2,137	3,370
Inadequately described	62	38	13	27	169	419
Not stated	3	6	-	-	76	734
Total	**4,875**	**4,304**	**2,830**	**4,861**	**13,450**	**33,517**

Source: 2011 Census

Table B.4 furthers the analysis by presenting commuters' places of work separated by their industries of employment, and should be read in conjunction with Table B.3.

Commuters to inner Sydney, totalling some 1,700, predominately work in the private services sectors such as finance and professional services. The next biggest industries of employment for commuters to inner Sydney are transport (790 people) and public administration (672 people).

The biggest employer for commuters who work outside Sydney is the construction sector, with 3,232 workers, followed by private services, wholesale and retail, manufacturing and health.

Just over half of the 2,830 Illawarra residents who commute to outer south-western Sydney for work are employed in the mining and education sectors. The majority of the 881 mining workers are employed in Wollondilly mines, while the majority of the 581 education workers are employed in Campbelltown.

It should be noted that journey to work data have been complied using a 'bottom up' methodology, by comparing place of residence with place of work at an LGA level, and aggregating the latter to form the general regions presented in the tables. To avoid the release of confidential data the ABS occasionally randomly adjusts small totals (which frequently occur when considering data at an LGA level). For this reason, the totals presented in Figure B.1, Table B.3 and Table B.4 do not match.

Table B.4: Commuters' industry of employment by place of work

	Inner Sydney	St George-Sutherland	Outer SW Syd	Rest of Sydney	Other NSW	Total
Agriculture	4	-	23	-	126	160
Mining	12	3	881	17	404	1,469
Manufacturing	202	379	263	668	1,346	3,095
Utilities	43	58	49	145	179	491
Construction	204	226	136	458	2,888	4,256
Wholesale	149	118	64	401	296	1,090
Retail	203	518	141	292	984	2,298
Hospitality	122	158	51	88	713	1,251
Transport	790	231	63	353	983	2,532
Information media	259	13	11	118	124	546
Finance	571	127	11	130	192	1,081
Rental and real estate	89	35	28	51	100	321
Professional services	515	413	75	306	472	1,909
Admin and support	194	74	19	142	815	1,314
Public administration	672	647	189	592	738	2,967
Education	309	354	581	493	829	2,653
Health	184	682	166	349	1,217	2,789
Arts and recreation	143	52	22	44	258	534
Other services	168	184	37	164	483	1,078
Inadequately described	46	37	21	61	272	606
Not stated	4	-	-	-	15	1,073
Total	**4,883**	**4,309**	**2,831**	**4,872**	**13,434**	**33,513**

Source: 2011 Census

Education

Both employed residents and workers in each of the Illawarra's LGAs are less likely to hold a university qualification compared to NSW and Australia as a whole. In part that trend is reflective of the occupational structure of the region described above.

Within the Illawarra, Wollongong workers are the most likely to hold a university qualification, with that share lifted by the university and hospital presence. In terms of employed residents, however, Kiama residents are the most likely to hold a university qualification. This is further evidence of the mobility of the Kiama workforce seen in the journey to work data displayed above.

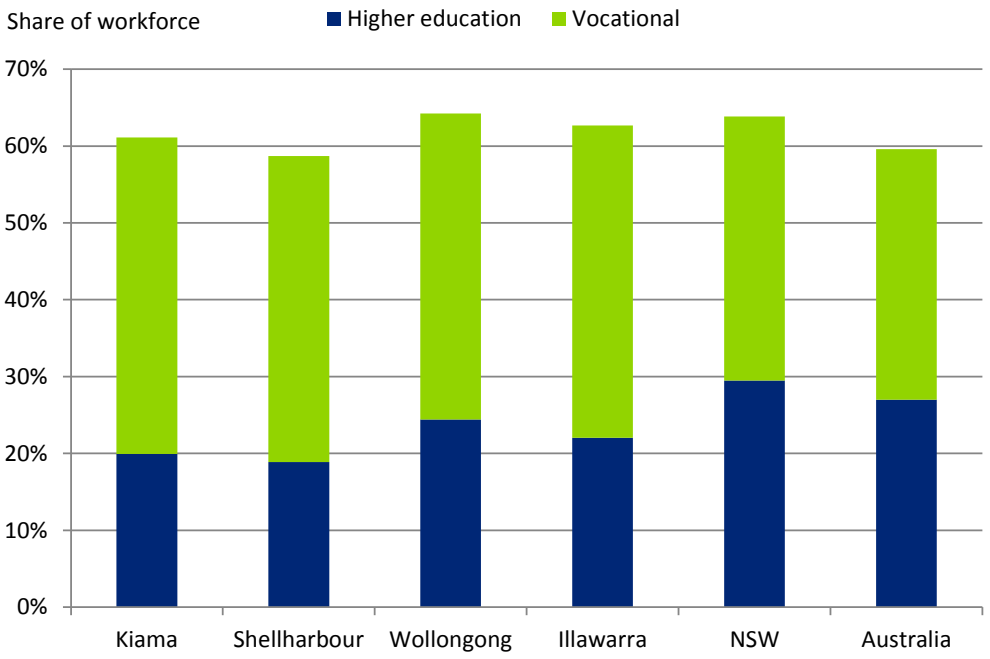
Chart B.17 shows the propensity of Illawarra (and NSW and Australian) workers to hold a post-school qualification, be it a university degree or a vocational education and training (VET) qualification.

Chart B.16: Share of working age population, workforce with university qualifications

Source: 2011 Census

Note: Data exclude those whose education level was not stated or inadequately described

Chart B.17: Share of workforce with a post-school qualification



Source: 2011 Census

Overall, Illawarra workers are not significantly more or less likely than their NSW or Australian counterparts to hold post school qualifications. However, the qualification mix

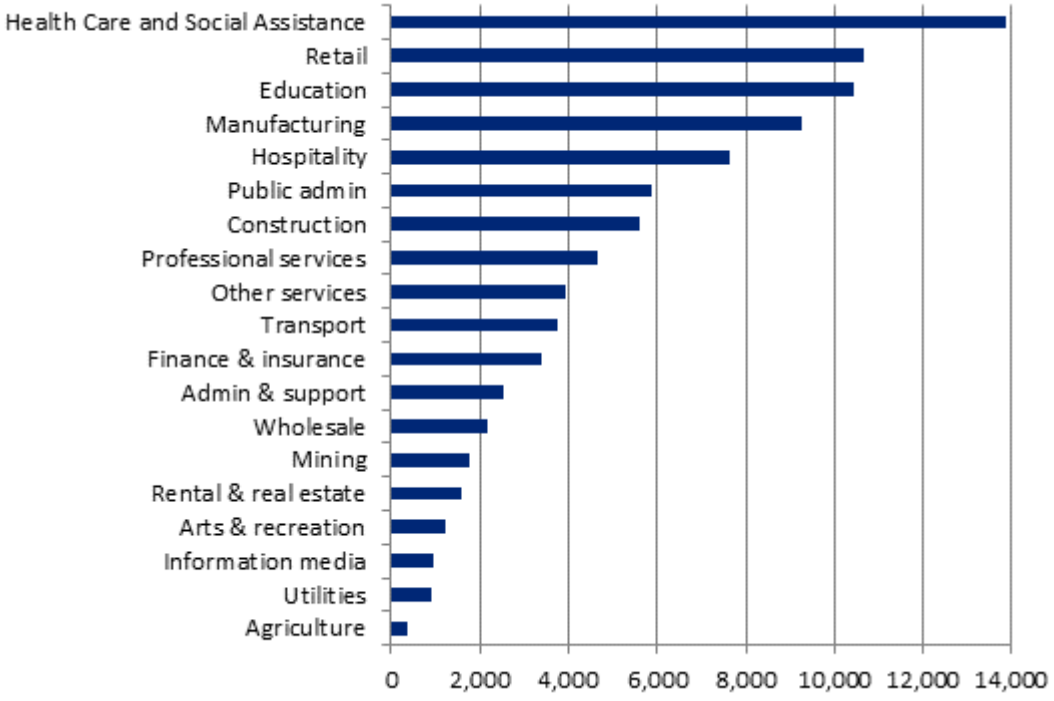
within the Illawarra's workforce is more heavily skewed toward vocational qualifications than the State and national averages.

Appendix C: Industry structure

Major employing industries

The Illawarra's total workforce at the 2011 Census was some 91,000 people strong. The biggest industry employer in the region is health care and social assistance, with around 14,000 persons employed, followed by retail and education, with just over 10,000 workers each.

Chart C.1: Employment in the Illawarra, 2011



Source: 2011 Census

As with most regions throughout Australia, the last twenty years have seen a gradual shift of the Illawarra's workforce away from traditional, 'blue collar' industries such as manufacturing and towards a range of higher skill service industries (see Table C.2).

This is seen most notably in the manufacturing sector moving from 16.2% of the Illawarra's workforce in 1996 to 10.2% in 2011. Over the same time period, health care has moved from 9.6% of the Illawarra workforce to 15.3%.

Table C.2: Industry employment shares over time

	1996	2001	2006	2011
Agriculture	0.5%	0.6%	0.4%	0.4%
Mining	3.0%	1.0%	1.4%	2.0%
Manufacturing	16.2%	15.4%	13.1%	10.2%
Utilities	1.2%	1.0%	0.9%	1.0%
Construction	7.6%	6.4%	6.6%	6.2%
Wholesale	3.6%	3.2%	2.5%	2.4%
Retail	10.4%	12.9%	13.0%	11.8%
Hospitality	7.2%	7.4%	7.7%	8.4%
Transport	4.9%	4.1%	4.1%	4.2%
Information media	2.5%	2.3%	1.4%	1.1%
Finance & insurance	3.4%	3.1%	3.5%	3.7%
Rental & real estate	1.7%	1.6%	2.0%	1.7%
Professional services	6.0%	5.9%	5.1%	5.1%
Admin & support	3.1%	3.0%	2.7%	2.8%
Public admin	4.9%	5.3%	6.1%	6.5%
Education	9.0%	10.0%	10.8%	11.5%
Health care and social assistance	9.6%	11.3%	13.0%	15.3%
Arts & recreation	1.3%	1.3%	1.4%	1.3%
Other services	4.0%	4.2%	4.2%	4.3%

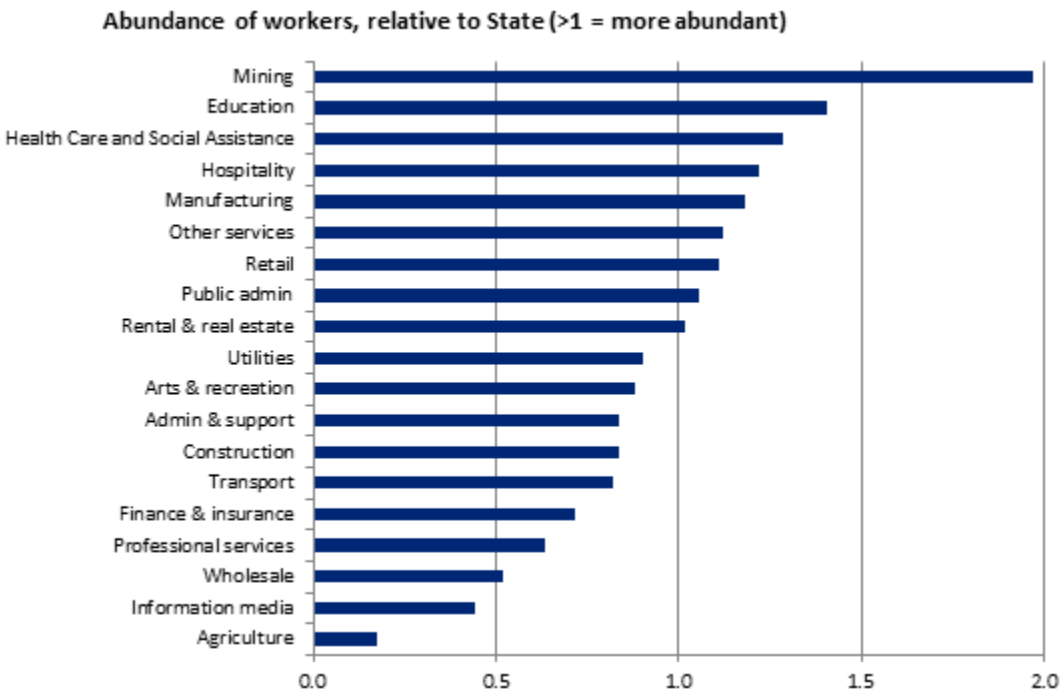
Source: 1996 - 2011 Census

Note: 1996 Census data are based on place of enumeration (where people filled in the form) whereas post 2001 data are based on place of work. 1996 data may therefore overstate the 'true' share of private services because they include commuters to Sydney and other regions.

Chart C.2 shows the industry intensity of employment in the Illawarra region relative to New South Wales as a whole. A value of 1 implies that a particular industry makes up the same share of the Illawarra's workforce as it does for the NSW workforce. A value greater than 1 implies the Illawarra's workforce is over-represented in that particular industry compared to NSW as a whole, and vice versa.

The industry with the greatest degree of over-representation in the Illawarra relative to NSW is mining. This is followed by education, given the notable role of the University of Wollongong, and health care and social assistance, given the region's relatively older demographic. IT services, professional services and finance and insurance all have representation well below the State average.

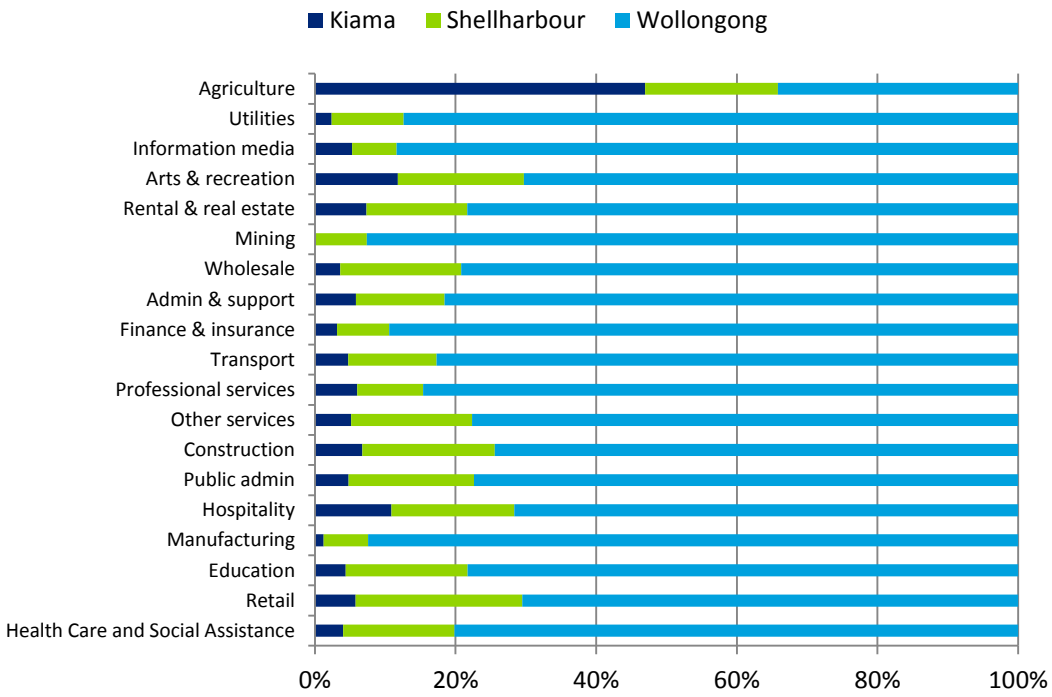
Chart C.2: Industry intensity, Illawarra relative to NSW



Source: 2011 Census

Chart C.3 shows the main industries of employment in each of the three LGAs considered as part of this data review. Unsurprisingly, Wollongong has the majority of workers in all except one industry (the exception is agriculture, from which almost half of the Illawarra's workers are employed in Kiama).

Chart C.3: Workforce composition by industry



Source: 2011 Census

More broadly, industries in which employment demand is driven to some degree by population growth, such as construction, wholesale and retail, hospitality and public services, tend to show regional employment composition broadly in accordance with the regions' share of the Illawarra's total workforce.

Table C.3 presents the data shown for 2011 in Table C.2 on a regional basis, with some marked differences in employment structure across the three LGAs. The region's strong representation in manufacturing is very much a Wollongong story; Kiama has a very strong representation in hospitality as a tourism locale; while Shellharbour punches above its weight with retail facilities. Health care and social assistance is a major employer across the region. However, despite an older demographic, the sector is less prominent in Kiama, with hospital and other medical facilities tending to have a greater presence in Wollongong and Shellharbour.

Table C.3: Regional workforce by industry, 2011

	Kiama	Shellharbour	Wollongong	Illawarra
Agriculture	3.5%	0.5%	0.2%	0.4%
Mining	0.1%	0.9%	2.3%	2.0%
Manufacturing	2.4%	4.2%	11.8%	10.1%
Utilities	0.5%	0.7%	1.1%	1.0%
Construction	8.0%	7.6%	5.8%	6.2%
Wholesale	1.6%	2.6%	2.4%	2.4%
Retail	12.9%	18.1%	10.4%	11.7%
Hospitality	17.4%	9.5%	7.5%	8.4%
Transport	3.7%	3.4%	4.3%	4.1%
Information media	1.1%	0.4%	1.2%	1.1%
Finance & insurance	2.2%	1.8%	4.2%	3.7%
Rental & real estate	2.4%	1.6%	1.7%	1.7%
Professional services	5.9%	3.1%	5.4%	5.1%
Admin & support	3.1%	2.3%	2.9%	2.8%
Public admin	5.9%	7.5%	6.3%	6.4%
Education	9.6%	12.9%	11.3%	11.4%
Health care and social assistance	11.7%	15.7%	15.3%	15.2%
Arts & recreation	3.0%	1.5%	1.2%	1.3%
Other services	5.0%	5.7%	5.0%	5.1%

Source: 2011 Census

Industry focus

Construction

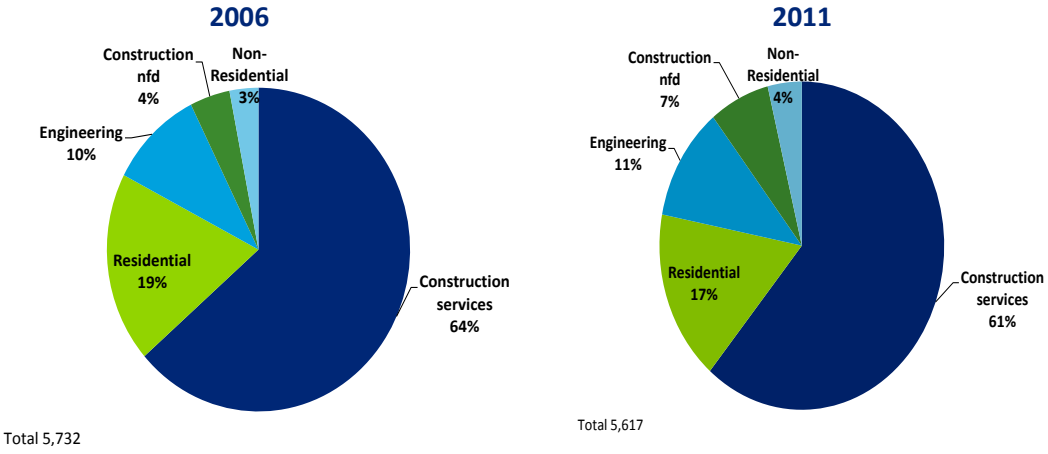
Construction employment in the Illawarra fell by some 2% between 2006 and 2011. Construction services make up around 60-65% of the region's construction workforce, of which 60% are building installation services (plumbing, electrical work, etc) and building completion services (carpentry, painting, etc).

Between 2006 and 2011 there was a slight shift within the construction sector, away from residential construction and toward heavy industrial construction. Specifically, construction services and residential construction employment fell by 6% and 13% respectively over the five years to 2011, while engineering and non-residential construction rose by 10% and 23% respectively.

In general, this shift is consistent with the strength of the region's mining sector in recent years, as well as a broad softness in the residential housing market.

Note, however, that in the 2011 Census the 'not further defined' category was 139 persons higher than in 2006 (indicating that a number of persons did not provide enough detail to allocate them into a specific sub-sector). This increase may mask some of the changes discussed above.

Chart C.4: Construction employment, 2006 v 2011 Census



Source: 2006 and 2011 Census

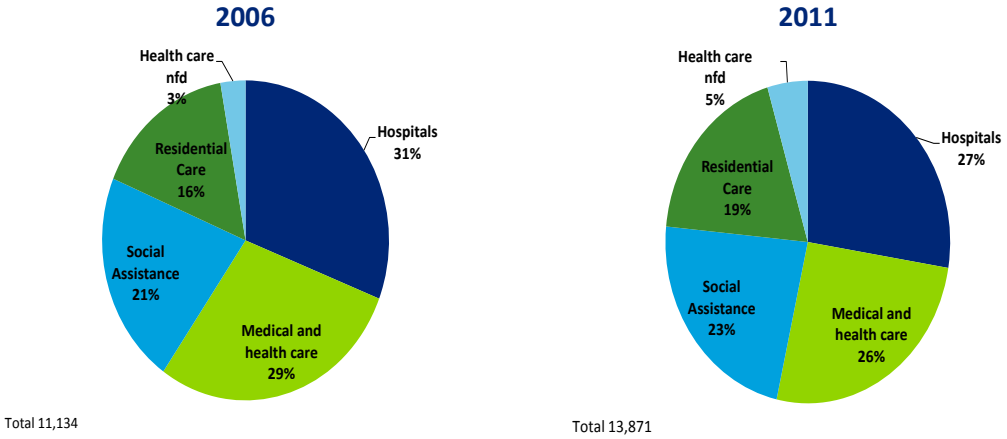
Health care and social assistance

With around 14,000 workers at the 2011 Census, health care and social assistance is the Illawarra's largest individual industry. Almost a quarter of these workers are employed directly by Wollongong Hospital, the region's major referral and teaching hospital. The next largest health care employer in the region is residential aged care, with around 2,400 workers at the 2011 Census, or 17% of the total.

Overall employment in the sector rose by around 25% between 2006 and 2011. While employment rose across all sub-sectors, the different relative shares in 2006 and 2011, as shown in Chart C.5 below, are indicative of the region's ageing demographic profile and the effect it is having on the local employment base.

Specifically, residential care services (primarily residential aged care) rose by some 48% over the five years to 2011, while social assistance services rose by 33%. While employment in hospitals rose, its rate of growth was less than half the health care and social assistance sector overall, causing its share to fall from 31% to 27% between the 2006 and 2011 Census.

Chart C.5: Health care employment, 2006 v 2011 Census

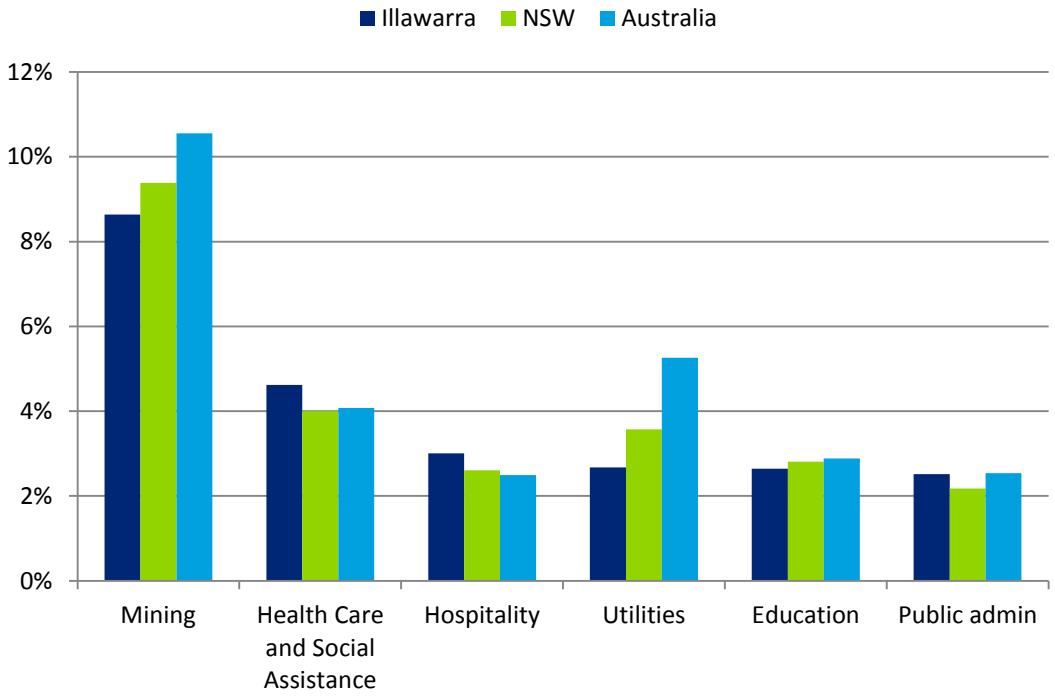


Source: 2006 and 2011 Census

Fast growing industries

Chart C.6 shows the top six industries in terms of average employment growth over the period from 2006 to 2011, while Chart C.7 shows the top six industries in terms of average employment growth between 2001 and 2011.

Chart C.6: Top six industries by average employment growth, 2006 to 2011



Source: 2006 and 2011 Census

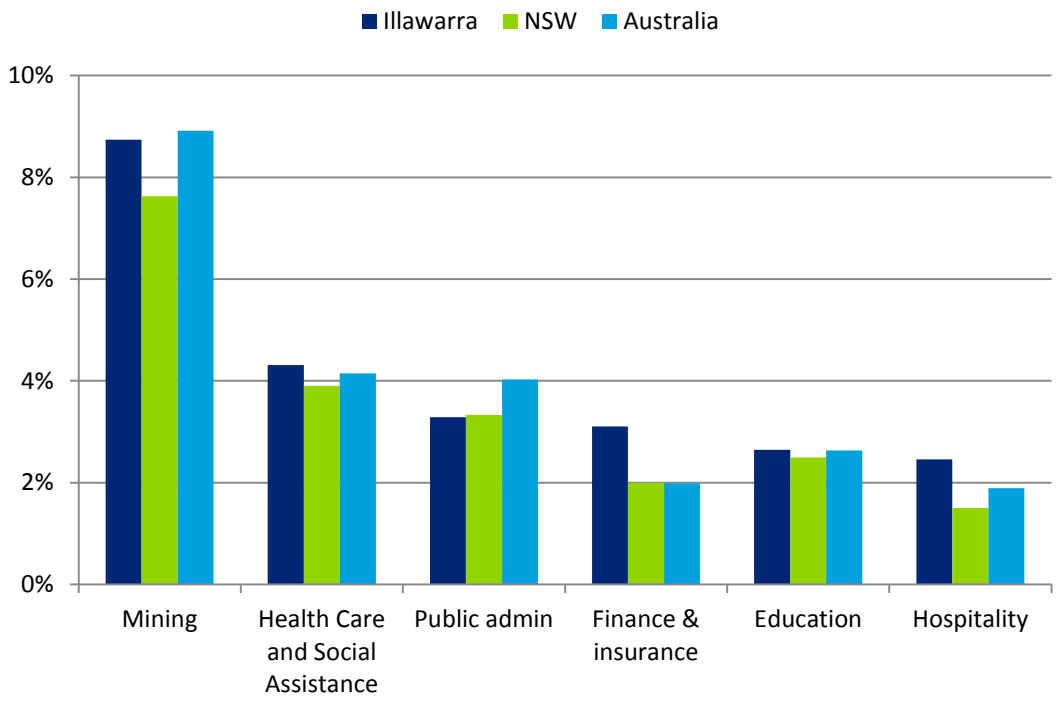
Five of these industries appear in both of the charts – mining, health care and social assistance, public administration, education and hospitality. Mining has been the fastest growing industry in terms of employment over both a five year and ten year period, and this is the case in NSW and Australia as a whole, not just the Illawarra. As noted above, health care and social assistance employment has grown strongly due to the presence of the Wollongong hospital and the region's relatively older age profile.

Importantly, over both a five year and ten year period, all of the 'strong' industries in the Illawarra have shown equal or greater strength at both the State and the national level. In other words, the Census data suggests that industry employment in the Illawarra has been growing in line with broader State and national level trends.

The hospitality sector is a notable exception, which over both a five year and ten year period grew more rapidly in the Illawarra compared to NSW and Australia. With tourism one of the region's priorities in regard to economic development, consistently strong growth in the region's hospitality employment may auger well in that regard, and is consistent with strong tourism growth in the region, particularly in terms of domestic visitors.

The finance sector is also a notable (and perhaps surprising) addition to Chart C.7. The sector is not a large employer in the region (in either an absolute or relative sense), and much of the growth in the finance industry has been in the superannuation sector, a trend which may continue into the future given the ageing of the population.

Chart C.7: Top six industries by average employment growth, 2001 to 2011



Source: 2001 and 2011 Census

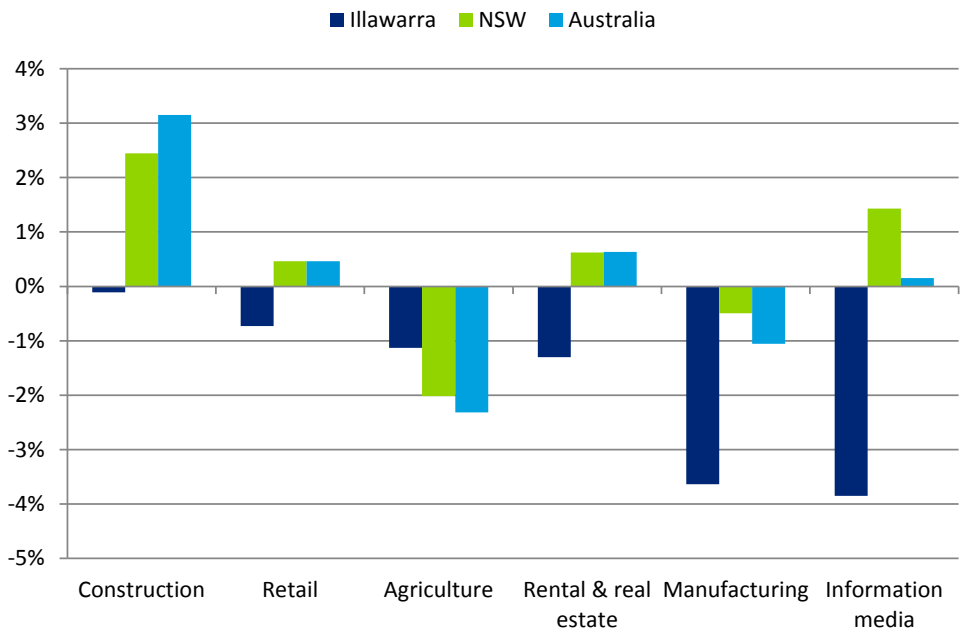
Slow growing industries

The industries which have recorded the slowest average employment growth in the Illawarra over the period from 2006 to 2011 and 2001 to 2011 are presented in Chart C.8 and Chart C.9 respectively.

Manufacturing employment is declining across the Australian economy. The Illawarra's manufacturing sector shed 17% of its workforce between 2006 and 2011, and a quarter of its workforce between 2001 and 2011. By contrast, manufacturing employment in New South Wales fell by 3% and 11% over the same two periods respectively.

The industrial mix of the Illawarra's workforce has seen a gradual transformation over the past two decades, and as noted below if the Illawarra's manufacturing workforce had instead grown at the State average between the 2006 and 2011 Census its workforce could be some 1,600 people larger.

Chart C.8: Bottom six industries by average employment growth, 2006-2011

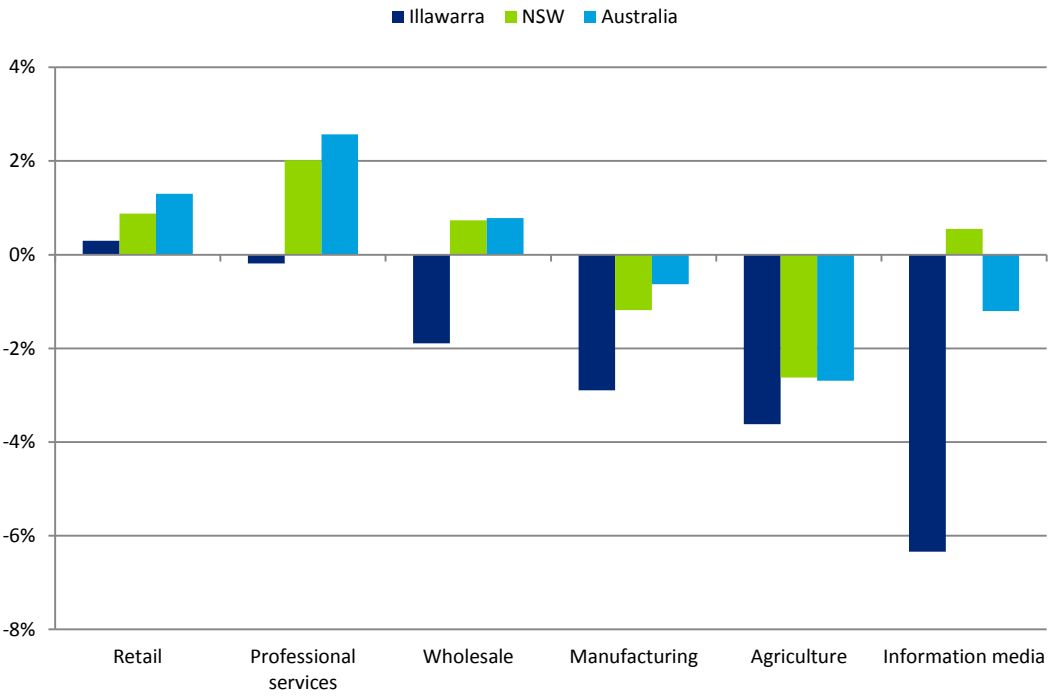


Source: 2006 and 2011 Census

Other poorly performing sectors include:

- **Information media**, where the continuing 'digitisation' of the sector has been consistent with a steady decline in 'traditional' media roles, and where high tech jobs are being consolidated in certain regions such as North Sydney. The University of Wollongong's recent push to expand its IT presence may bode well for the region's IT workforce in the future.
- **Rental and real estate,** which has experienced a cycle of low population and employment growth, generating lower housing activity.
- **Agriculture and construction**, which have both been stagnant in the Illawarra region for some time.

Chart C.9: Bottom five industries by average employment growth, 2001-2011



Source: 2001 and 2011 Census

Overall, a combination of factors has contributed to the relatively slower employment growth in the Illawarra compared to growth in NSW and Australia. Certainly the relatively higher share of manufacturing employment in the Illawarra has weighed on overall employment growth, but that does not explain the full picture.

To examine the impact of the region's industry structure on the pace of employment growth, it is useful to estimate a hypothetical employment series for the Illawarra region by comparing actual employment growth in the Illawarra between 2001 and 2011, with growth at the State and national levels. In other words, for each of the five year periods, actual employment in the Illawarra is compared with the employment that would have occurred if the Illawarra's workforce had grown in line with the State and national averages.

Table C.4 shows that between 2006 and 2011, the Illawarra's workforce grew by 4,000 fewer people than it would have had the Illawarra grown in line with the State average. Manufacturing is by far the biggest contributor to this, accounting for almost half of the 'lost' workers over the past five years.

Over the period from 2001 to 2006, the Illawarra's workforce actually performed better than it would have had it grown in line with the State average. However the overall figure masks significant 'losses' at the industry level, notably professional services, information media and wholesale trade.

Table C.4: 'Lost employment' in the Illawarra relative to NSW

	2001-2006	2006-2011
Manufacturing	-166	-1,611
Construction	326	-756
Retail	19	-656
Professional services	-585	-449
Information media	-652	-295
Arts & recreation	238	-205
Admin & support	143	-180
Rental & real estate	434	-159
Education	203	-85
Wholesale	-551	-82
Transport	183	-81
Mining	150	-62
Utilities	-82	-41
Agriculture	-60	16
Other services	212	30
Finance & insurance	258	61
Public admin	-107	97
Hospitality	471	145
Health Care and Social Assistance	107	403
Total	**539**	**-3,910**

Source: Deloitte Access Economics estimates from ABS Census data

As Table C.5 shows, the situation has been worse when comparing the Illawarra's employment growth with what would have occurred had the Illawarra instead grown in line with the national average, particularly between 2001 and 2006.

Table C.5: 'Lost employment' in the Illawarra relative to Australia

	2001-2006	2006-2011
Manufacturing	-1,153	-1,308
Construction	-499	-979
Retail	-458	-656
Professional services	-694	-614
Information media	-457	-218
Arts & recreation	153	-192
Mining	-176	-162
Rental & real estate	332	-160
Transport	113	-154
Utilities	-607	-123
Education	-29	-122
Admin & support	81	-79
Other services	-111	-75
Wholesale	-64	-47
Public admin	152	-6
Agriculture	202	21
Finance & insurance	-377	131
Hospitality	198	188
Health Care and Social Assistance	-118	356
Total	**-3,512**	**-4,198**

Source: Deloitte Access Economics estimates from ABS Census data

The manufacturing industry has certainly been an important contributor to the Illawarra's lacklustre employment growth. However, as the tables above show, several industries in the Illawarra, not just manufacturing, have seen employment growth below the State and national average.

A changing industry structure

Chart C.10 presents the Illawarra's share of total NSW employment by industry in 2012-13 relative to in 1994-95 (the earliest year for which detailed regional employment data are available). Where the ratio is greater than 1, the data implies that the region's share of NSW employment in 2012-13 was greater than in 1994-95, and vice versa.

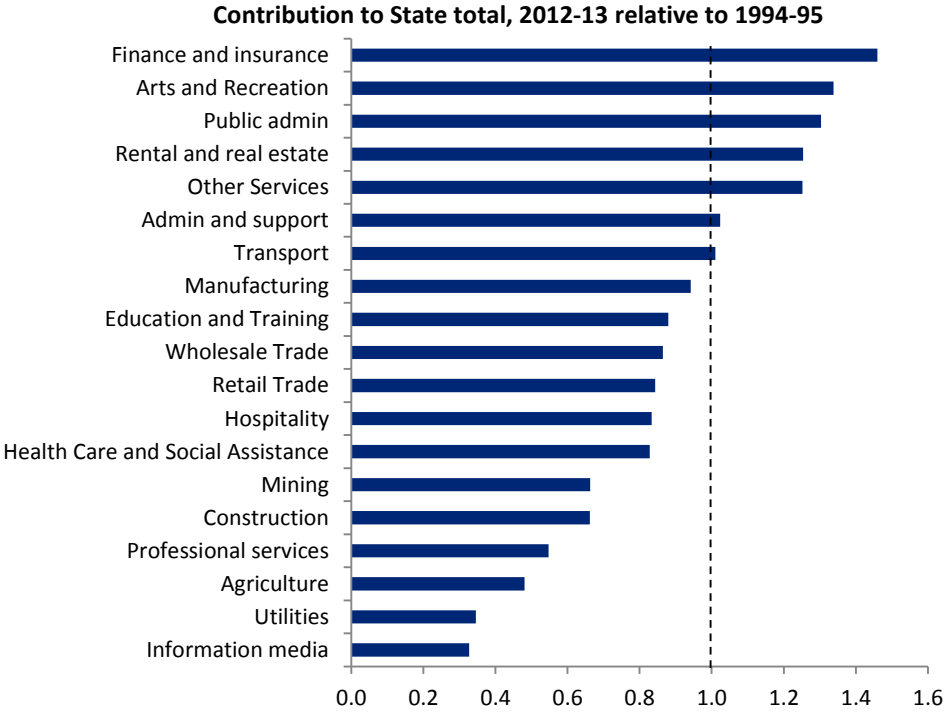
Importantly, some of the region's traditional industries of employment, such as manufacturing, mining and the utilities, made a lower contribution to total NSW employment in 2012-13 compared to in 1994-95. Further, the industries for which the State contribution is higher in 2012-13 suggest a gradual diversification of the region's employment base.

Information media also makes up a considerably lower share today than it did in 1994-95, which reflects the structural adjustment seen in that sector over the same period. In other words, the 'digitisation' of this sector has caused both a conglomeration of 'high tech' jobs

in 'tech areas' such as North Sydney, as well as a reduced need for 'traditional' media jobs in regions such as the Illawarra.

That said, with much of the sector's structural adjustment having already occurred, and with the University of Wollongong's push to expand its IT focus, the region has strong potential to once again increase its share of New South Wales' IT workers.

Chart C.10: The changing structure of the Illawarra's workforce



Source: ABS Labour Force Survey

The housing market

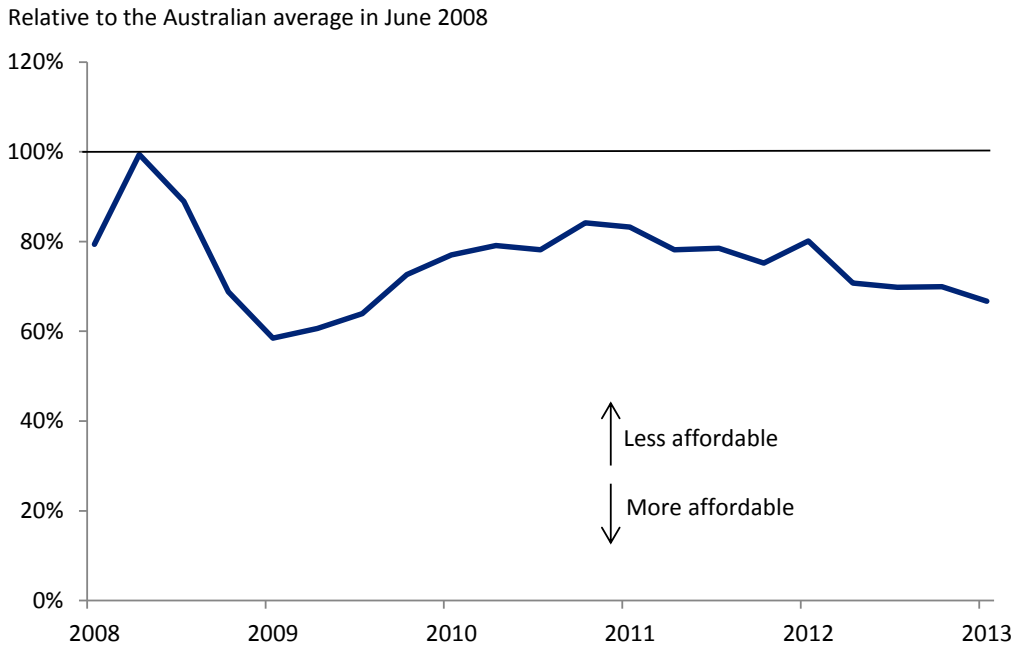
The slow population growth and workforce growth referred to earlier have also kept Illawarra housing values relatively low compared to other regions. One positive of this is that the Illawarra has traditionally been amongst the most affordable regions in NSW to buy a house, certainly when compared with Sydney.

Chart C.11 presents an estimate of housing affordability for the Illawarra region, relative to the Australian average in the June quarter of 2008. Specifically, the chart shows the estimated mortgage stress of an average homeowner in the Illawarra region today by dividing the expected interest payment on an average house in the region by the average household's income in the region. This is compared with a 'baseline' estimate of mortgage stress, which in this case is assumed to be the Australian average just before the 2008 financial crisis.

If the index is greater than 100%, it means that interest payments make up a greater share of the average Illawarra household's income today than they did of the average Australian household's income in 2008. The low housing prices in the Illawarra have consistently

made houses in the Illawarra more affordable than the Australian average, and this gap has become greater over the last six years.

Chart C.11: Housing affordability



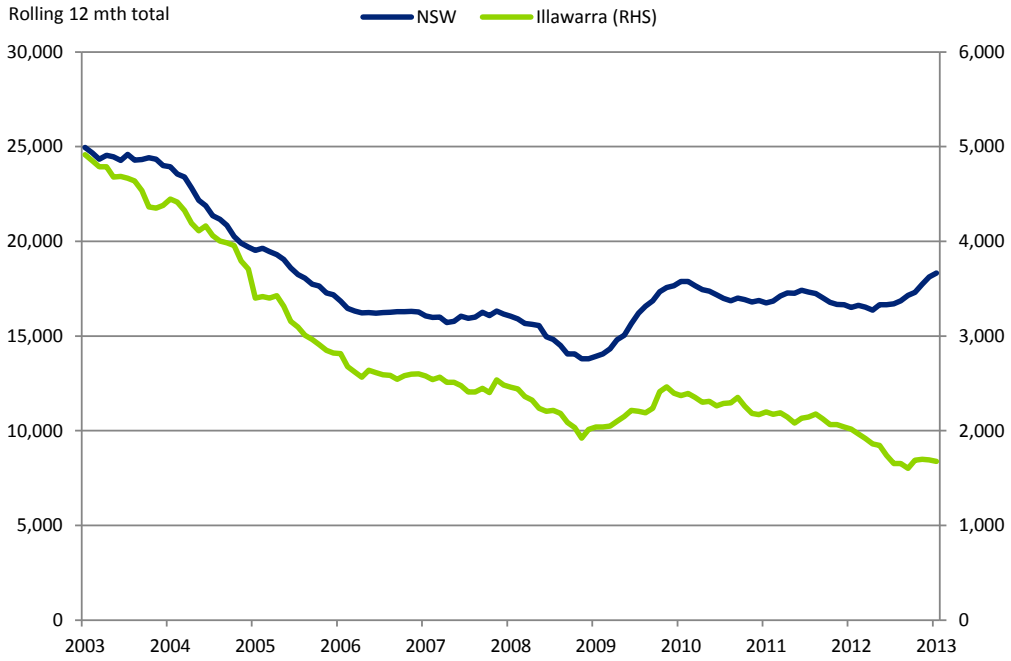
Source: RP Data; Deloitte Access Economics

Chart C.12 shows that the Illawarra region's relatively slow population growth has contributed to a decline in overall building activity, as measured by private sector dwelling approvals. Driven by slower economic and population growth relative to other States, housing approvals in New South Wales fell steadily between 2003 and 2008. The Illawarra region broadly followed suit, though with a faster pace of decline.

One reason for the Illawarra housing market's quicker downturn than the State's is that the region's population growth has lagged behind the State average. Moreover, house price growth in the Illawarra has been lacklustre, providing less incentive for new home construction in the region.

While both NSW and the Illawarra experienced a fiscal stimulus-driven lift in dwelling approvals in the immediate aftermath of the 2008 global economic downturn, the two series shown in Chart C.12 have since diverged. While the State total has slowly begun to regain lost ground, approvals in the Illawarra once again turned down.

Chart C.12: Private sector dwelling approvals, NSW and Illawarra



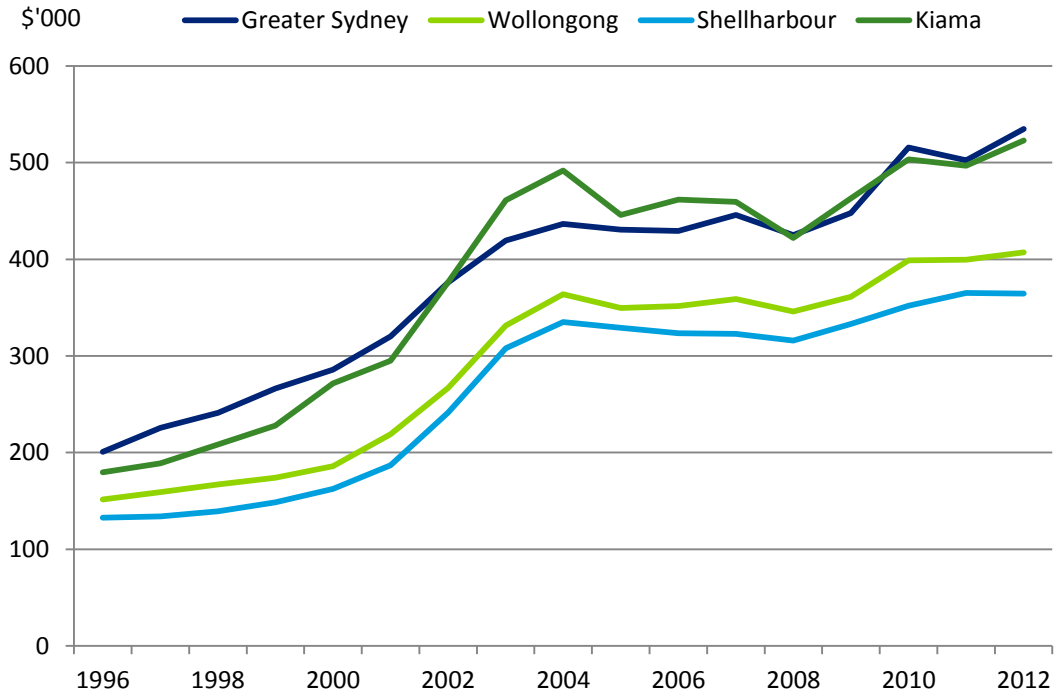
Source: ABS 8731.0

Note: The definition of the Illawarra region used in this particular data series prior to 2012 included Wingecarribee. For consistency, Wingecarribee has also been included in the post 2012 data.

Chart C.13 shows the median house price of each of the Illawarra LGAs, compared with that of greater Sydney, since the mid-1990s. Kiama generally sees median house prices comparable with those of greater Sydney, reflecting the large number of wealthy retirees in that area. Shellharbour and Wollongong have consistently recorded a median sale price well below that of greater Sydney. This is consistent with Deloitte Access Economics analysis which indicates housing affordability in the Illawarra has generally been better than that in Sydney.

That said, it is important to remember that the median price is not the same as the average price; it is merely the mid-point. Many stakeholders have expressed concern at Wollongong's high house prices. Indeed, recent sales figures indicate that housing values in certain areas – particularly coastal suburbs of northern Wollongong such as Austinmer and Coledale, as well as coastal suburbs of Shellharbour such as Barrack Point, are considerably higher than the figures below.

Chart C.13: Median house price through time, Illawarra LGAs vs Sydney



Source: Housing NSW

Tourism

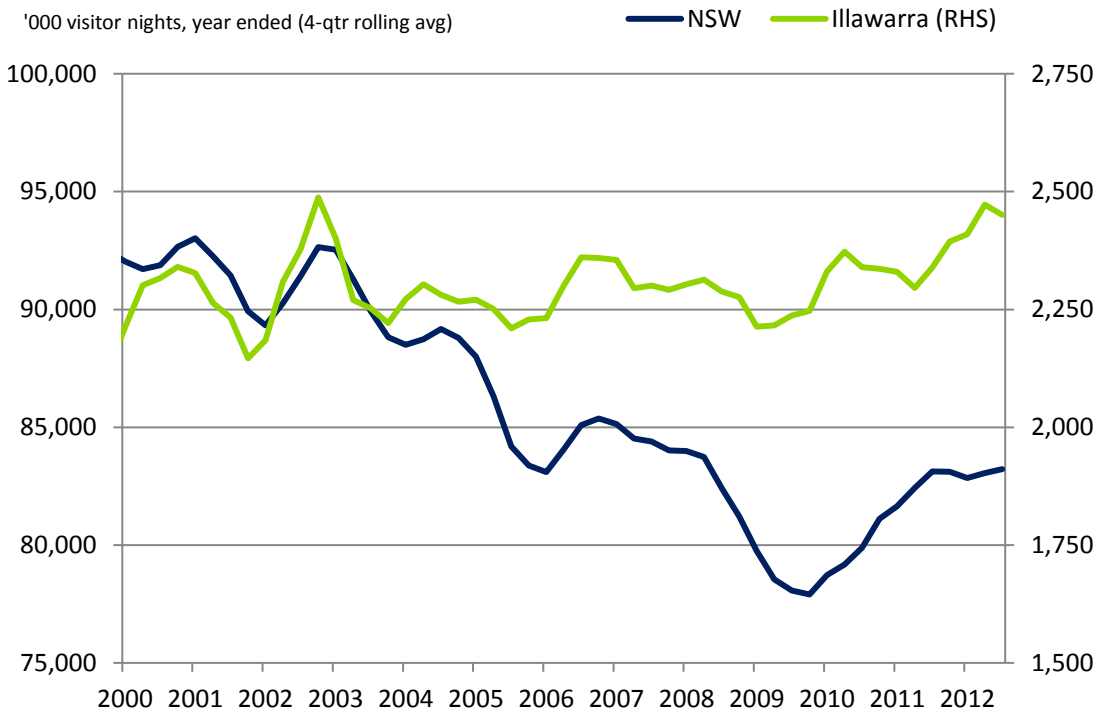
Given its natural amenity it is unsurprising that the Illawarra region has a strong tourism focus. The major source of tourism to the region is domestic, with around two-thirds of total visitor nights from domestic tourism compared to around 55% for NSW as a whole.

As shown in Chart C.14, the Illawarra (which is broadly defined by Tourism Research Australia to match the definition used by RDAI) has gradually increased its share of domestic tourism in NSW. That share has risen from 2.4% in 2000 to around 3% in 2012.

This is likely to reflect a number of factors, including economic decisions (families worried about their finances opting for a week in Wollongong rather than overseas), a concerted effort on behalf of the region's tourism operators to enhance their public profile, and greater accessibility to the Illawarra region from Sydney.

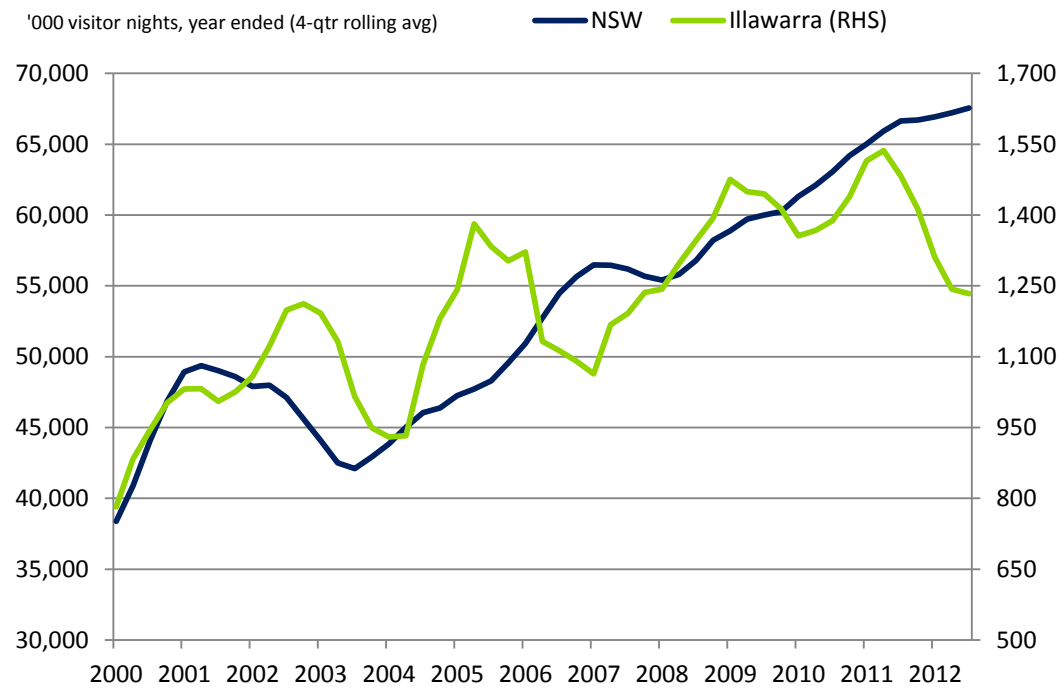
Most (around 85%) of the domestic visitors to the South Coast (which includes the Illawarra) were from NSW, according to Tourism Research Australia's most recent regional tourism profile. However the occupancy rate of South Coast accommodation providers in 2011-12 was only 50%, well below competing regions such as the Hunter (62%), Sydney (79%) and NSW as a whole (65%).

Chart C.14: Domestic visitor nights, Illawarra and NSW



Source: Tourism Research Australia

Chart C.15: International visitor nights, Illawarra and NSW



Source: Tourism Research Australia

As the $A has risen, it is no surprise that domestic tourism, as shown above, has either fallen (in the case of NSW) or stagnated (in the case of the Illawarra). However a strong currency also makes it relatively more expensive for overseas tourists to visit Australia, and the fact that international visitor nights have risen despite the elevated $A suggests that other factors, such as rising incomes in emerging economies, are more prescient at the international level.

Port Kembla

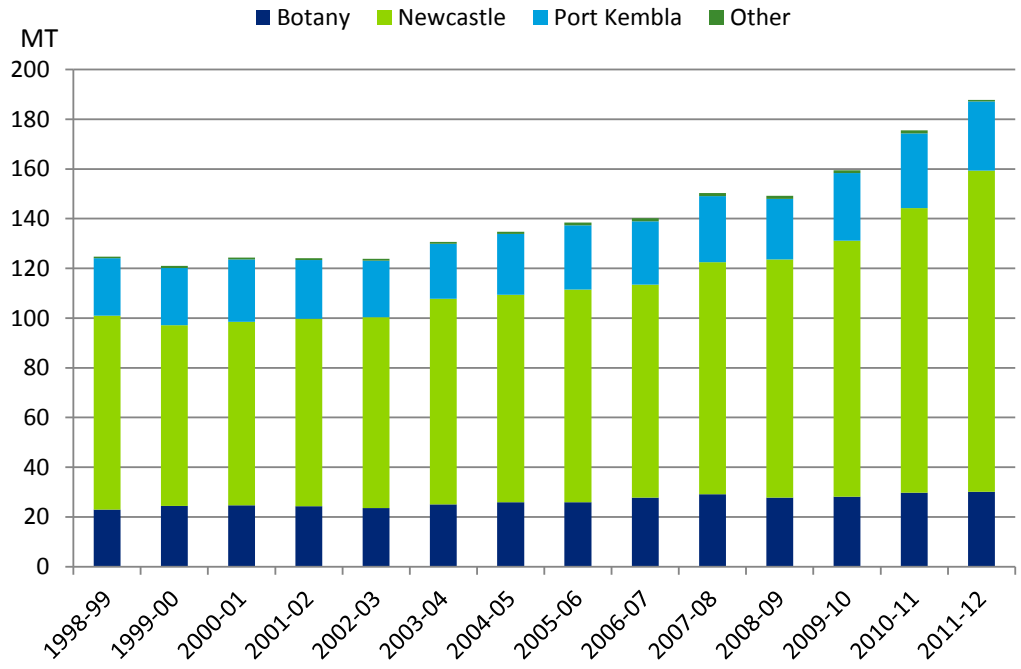
Port Kembla is a major employer in the region, both directly and indirectly. As noted above the transport industry has been one of the Illawarra's fastest growing sectors (in terms of employment) in recent years.

In 2011-12, Port Kembla accounted for some 15% of the total sea freight task in NSW, recording 14% of exports and 21% of imports by weight. This share has fallen slightly over the last decade, owing largely to strong growth in coal exports from the Port of Newcastle. Total exports from the Port of Newcastle increased by some 75% between over the decade to 2011-12.

By weight, around 75% of total throughput at Port Kembla is made up of exports, with that share growing steadily from 60% over the last ten years. The port has three main exports – coal, grain and steel – which accounted for around 90% of total export volumes in 2011-12.

Most of the export growth over the past decade has been from coal, which accounted for about 70% of the Port's total exports in 2011-12. Although the Port of Newcastle has been the biggest beneficiary of the explosion in coal mining, Port Kembla has seen its coal exports grow by some 60% since 2001-02.

Chart C.16: Total trade throughput, Port Kembla, Botany and Newcastle



Source: Ports Australia

That rise is consistent with a lift in coal production and exports throughout NSW and Australia more generally over the same period. Strong demand for coal in China and other emerging Asian economies has seen the price of coal increase sharply over the last decade, including a rise of 450% between late 2002 and late 2008 before prices retreated.

The spot price of coking coal is currently trading around $150 per tonne, down from $160 per tonne at the start of the year. The spot price of thermal coal is currently trading around $87 per tonne, down from $95 per tonne at the start of the year.

Grain exports from Port Kembla may also benefit from continued economic growth and development in emerging Asian economies over the decades ahead. The trade is highly susceptible to weather conditions and the size of the crop (adverse seasonal conditions resulted in zero grain exports from Port Kembla in 2007-08), though has grown strongly in recent years to reach almost 3 million tonnes, the highest level since the beginning of last decade.

Like coal, continued economic growth in China and other emerging Asian economies supports the outlook for grain exports. In part, that is driven simply by demographics, with the population in key Asian export markets expected to continue to expand. However there are other relevant factors as well, including a lack of groundwater for irrigation and other environmental pressures in China, which may continue to suppress the supply of agricultural commodities in that country, as well as important expected changes in diet as Asian incomes rise.

Finally, exports of steel in 2011-12 were broadly the same total volume as for grain. However the outlook for Australia's steel manufacturing sector is dim. High input costs, low steel prices and the elevated $A are contributing to undermine the competitiveness of domestic production, particularly in export markets.

These factors have been highly relevant for BlueScope Steel, which manufactures steel at Port Kembla. Indeed, the company has moved to shut down its No 6 blast furnace and is no longer pursuing export opportunities. BlueScope Steel will instead focus on production for the domestic market. A rapid decline in steel exports through Port Kembla could therefore be expected.

On the imports side, one potential upside for the Port is motor vehicle imports. The decision by the NSW Government to relocate the gateway for motor vehicles into NSW to Port Kembla has provided an important foundation trade for the Port.

University of Wollongong

Another important economic institution within the region is the University of Wollongong. The University produces economic output worth $659 million, suggesting that its activities account for some 5% of the Wollongong economy (University of Wollongong 2013).

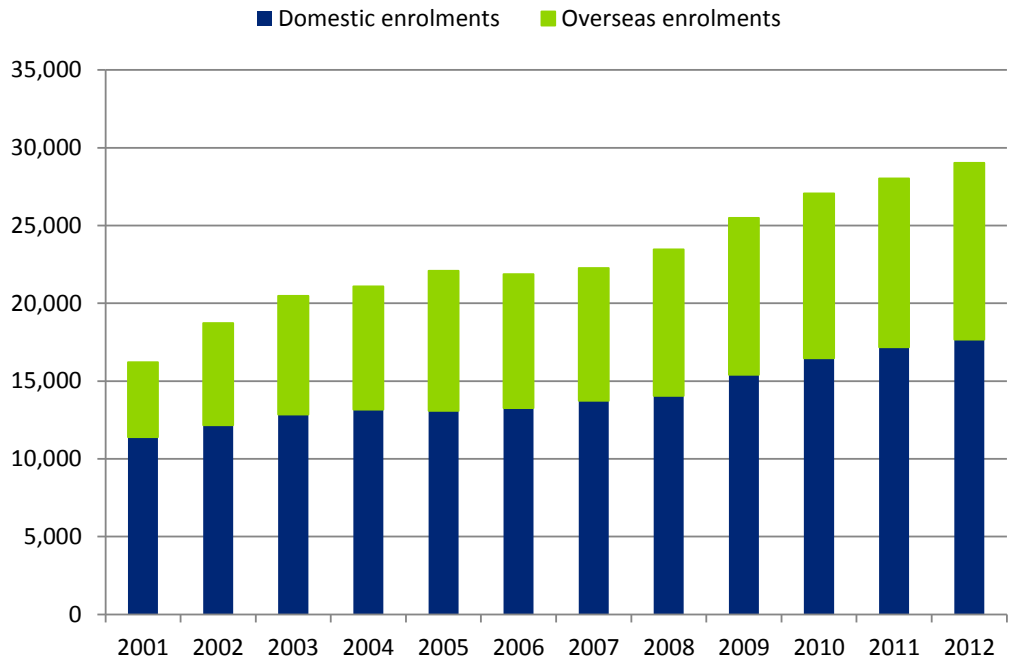
In 2012 the University of Wollongong had around 29,000 student enrolments, the equivalent of around 7% of the Illawarra region's population.[12] The Illawarra region

[12] This figure represents total enrolments. The UOW has campuses throughout the South Coast region, two in Sydney, as well as one in Dubai. The available data do not show enrolments by campus.

contributes approximately 5% of the NSW workforce and 6% of the NSW population; by contrast, the University of Wollongong contributes some 7% of NSW university enrolments, and 13% of the State's international student enrolments.

In 2012 almost 40% of the University's enrolments were overseas students, up from 30% in 2001. Overall student enrolment has grown by some 13,000 since 2001, of which just over half have been overseas students (see Chart C.17).

Chart C.17: University of Wollongong student numbers, 2001-2012



Source: Department of Industry, innovation, Science, Research and Tertiary Education

In terms of overall student numbers the University of Wollongong is one of the smallest universities in the State (only Southern Cross University and the University of New England have a smaller enrolment base). However in terms of international student enrolments, the University of Wollongong is one of the largest universities in the State. At around 40% of the total student base, the share of international students at the University of Wollongong is the highest in NSW and amongst the highest across all Australian universities.

This makes the region especially susceptible to the market for overseas students, which itself is heavily dependent on economic factors (both domestically and abroad), as well as government policy regarding visa arrangements.

Appendix D: Drivers of regional development

This section reviews the international and domestic literature on regional development and explores the current regional development strategies applying in the Illawarra. The purpose of this review is to:

- identify lessons from the academic literature on successful regional development, building on the experience of other jurisdictions;
- summarise current development strategies in the Illawarra and the key themes of previous strategies; and,
- identify any insights for future economic development strategies in the Illawarra.

The concept of regional development has evolved as the economy evolved. According to McCall (2010):

> *"in the 1950's it [regional development] had a strong economics basis and a focus on what firms did in regions and how their performance influenced a range of economic indicators. Towards the end of the 20th century, regional development became far more multi-disciplinary in its approach. Political science, public policy and sociology became critical disciplines alongside economics focusing more on the notion of what a region might be and how a range of factors – not just economic – shaped the idea of a region. In the 21st century economic geography has joined the disciplines and the focus of regional development is more on the spatial dynamics of regions – as places to live, work and invest."*

Correspondingly, it is expected that regional development strategies will continue to evolve over time. According to McCall, the current trends for regional development "focus on human and social capital, innovation and the spatial dynamics – demographic change – as key components…"

While the concept of regional development may have shifted over time, regional development strategies typically include the following elements (Sorenson, 2000): more and better quality infrastructure (soft and hard), improved community services, greater and more diverse volume of production, lower unemployment, employment generation, raising average wealth, and improving quality of life. The discussion that follows presents some key insights from overseas and Australian studies of regional development.

Insights from overseas studies

Polese (2013) draws upon experience from Canada to identify seven key considerations relevant to regional development. The paper does not propose a particular strategy for development but rather considers factors which affect the effectiveness of any policy. These considerations include:

- the forces of agglomeration will not lessen;
- top cities will remain so;
- distance continues to matter;
- costs matter and are a driver of non-metropolitan growth;
- market access increasingly matters;
- natural amenities e.g. sea and trees matter but their importance is constrained by distance; and,
- natural resources can both be a driver of growth and an impediment to growth.

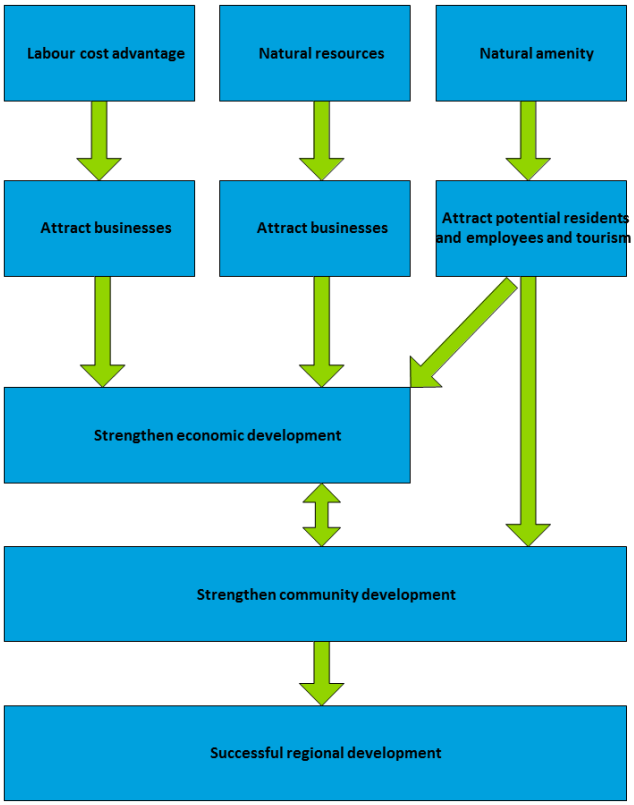
Polese argues that the chief discriminating factor driving regional development is distance rather than whether an area is metropolitan or non-metropolitan. More precisely, what matters is relative distance to the largest metropolitan areas. As a result, peripheral regions will continue to face the same challenges as in the past. Thus a reduction in the cost of transport will not necessarily improve a region's relative advantage (or disadvantage) if there remain large distances between the region and major metropolitan areas. Furthermore, Polese notes that the cost of transporting people has not necessarily fallen given that the opportunity cost of time also rises over time.

Polese concludes that success in terms of regional development hinges on the basis of one (or a combination) of the following three factors:

- a labour cost advantage that allows regions to capture industries fleeing the high costs of large metropolitan areas;
- a natural amenity advantage that allow them to attract young retirees and others in search of the sea, sun, and trees; or,
- a natural resource advantage such as the presence of untapped mineral resources.

A diagram of how the three elements can improve regional development is shown below in Figure D.1.

Figure D.1: Flow chart of regional development



Source: DAE based on Polese (2013).

The flowchart above is one interpretation of how regional development can occur based on Polese's three factors. Low labour costs tend to attract business and employees, which is also true for the presence of natural resources. If the region is able to attract enough businesses this will lead to greater economic development.

Economic development also leads to community development as some employees choose to reside in the region. Further community development also makes the region more attractive as new residents contribute to the local economy. The presence of natural amenities might also attract people to the region and contribute to community development.

Polese notes that, in Australia, natural resources are likely to remain the principal source of growth for peripheral areas; much of it concentrated in mid-sized service support centres such as Wollongong. However, a major lesson of the Canadian experience was the contradictory nature of resource-led growth. Resources raise incomes in the area but also crowd out other industries in the area, and this retards regional development. The most striking examples of this in Australia are in mining towns, but it can also be a factor in more diversified economies like the Illawarra.

Tomaney (2012) discusses the OECD's new "place-based approach". A place-based approach is focusing on functional economic areas rather than administrative regions. This has relevance for the current project. In the Illawarra context, this might be interpreted as focusing on the Illawarra economy rather than, for example, the Wollongong LGA economy or the Shellharbour LGA economy.

Under a place-based approach there is a need for a unified approach which combines land-use, economic development, skills and innovation across all levels of government, business and non-government organisations. Tomaney's view is that:

> *"Effective public policy and adept local and regional institutions focused on functional economic areas, rather than administrative boundaries also play a part. Long-term integrated regional policies which identify key local assets such as high growth firms or emerging clusters, innovative activities or skills appear to matter to long-run growth."* (Tomaney, 2012)

Tomaney also notes that between 1995 and 2005 a common characteristic of growing regions is their strong performance in relation to human capital and innovation. In fact, the study suggests that infrastructure alone has no impact on growth unless regions are endowed with adequate human capital and innovative capacity. The author points out a number of regional European examples that have developed policies under the new paradigm to achieve success. One example was Oulu in remote Northern Finland. In this case the stakeholders pursued a long-term strategy to develop as a hub of high technology high growth industries. To achieve success many stakeholders had to expand their technological competence in different fields. They also built their business know-how by forging close and effective working relationships between universities, key companies and government-backed technology search and research centres.

Insights from Australian studies

Jain (2012) examines the usefulness of current government policies and business association programs in Casey aimed at developing self-sustaining regional development. The author does this using a framework of analysis based on the integrated model of sub-national regional and urban economic development. This is achieved by examining perceptions and evaluating the extent of adoption of these policies by manufacturing and home-based businesses.

In general, the study finds that current government policy and business association programs are not sufficient for the development of self-sustaining businesses in peripheral urban regions such as The City of Casey. Specifically, the author notes that,

> "The elements of business development set out in the framework of analysis are not strongly evident or supported in the region. Fragmentation, weak network linkages, lack of strong government commitment at all levels is prevalent. *The shortcomings of local government public policy can be attributed to lack of commitment to funds, lack of staff or resources by elected officials. Of all the well-meaning business development policies, the only one achieved thus far has been the modest release of new land for industrial development…" (Jain, 2012)*

However, the framework identified some effective (and well received) public policies and programs supporting business development. These were:

- rezoning of agricultural land to residential, commercial and industrial;
- the Commonwealth Government's New Enterprise Incentive Scheme (NEIS) for the unemployed providing accredited small business training, business advice and

mentoring and income support for up to 52 weeks and financial incentives provided through the New Apprenticeship Scheme; and,

- export related programs including the Export Market Development Grants, the state's Grow Your Business Program and Industry Capability Network Victoria.

The author says that the Commonwealth Government allows urban sprawl, resulting in conflict between the core and the peripheral regions and increased economic disparity. Urban sprawl has enabled regions like Casey to grow rapidly by making cheap land readily available for housing and industry. However, in many cases these peripheral regions are faced with problems of slow business development, low GRP, lack of community, job leakage, lack of infrastructure, increased commuting times and a general sense of detachment among residents.

The author notes that there are a number of options available for regions like Casey. In particular, she cites Stimson et al. (2009), who suggest promoting programs and strategies to attract, generate and nurture entrepreneurial skills. According to Stimson et al (2009), these policies are more likely to result in self-sustained (or endogenous) business creation and economic development. To develop entrepreneurial skills, investments in education and networking, formation of 'technopoles' (technology-focused areas), gateways and intelligent cities are required. Finally, government intervention is needed for increasing innovation in Casey, both at the local university and with new industry and university partnerships.

Another way of seeing development is presented by KPMG (2012). Regions can attract business and people through a range of cost and other factors. The location of a site is a very important decision for a business as it would influence the level of market access and the costs that would be incurred by the firm. There are also personal factors which would also influence the site location of a business; some of these factors are presented in Table D.2.

Table D.2: Key site location factors

	Cost factors	Other key factors
Business	**Business costs**	**Business environment**
	• Land/building/office	• Labour availability and skills
	• Labour wage/salary/benefits	• Access to markets, customers and suppliers
	• Transportation and distribution	• Road, rail, port, airport infrastructure
	• Utilities	• Utility and telecom/internet service reliability
	• Financing	• Suitable land sites
	• Federal/regional/local taxes	• Regulatory environment
Personal	**Cost of living**	**Quality of life**
	• Personal taxes	• Crime rates
	• Cost of housing	• Health care facilities
	• Cost of consumer products and services	• Schools and universities
	• Healthcare costs	• Climate
	• Education costs	• Culture and recreation

Source: KPMG

The table above summarises key factors by decomposing them into cost factors and other factors and from the perspective of the business and individual. The relative importance of these factors varies with different industries and individual businesses: for the business this would be influenced by the type and maturity of the market the firm is trying to serve. Thus the decision to locate would involve a comparison of cost factors and other key factors of each region, and choosing the best region that best meet their needs. Naturally, personal factors should also complement the business factor to ensure that there is sufficient human capital to meet the needs of the business. As such, the emphasis on different factors would result in the region attracting different types of businesses and people.

Different approaches to regional development

The experience of regional development in Australia has shown that there is no unique path for regions to follow to achieve regional development. For example, the Gold Coast relied heavily on tourism, housing construction and its proximity to Brisbane to grow. Similarly, Cairns grew on the back of significant tourism inflows and also attracting selected industries to the region. Other regional areas such as Gladstone, Port Hedland, Mudgee and Townsville have benefitted substantially from the growth of the mining sector. Still others have benefitted from being seen as an idyllic coastal location for sea changers in retirement. Both Port Macquarie and the Sunshine Coast have grown sharply over the last decade partly as a result of the sea-change phenomenon.

The Hunter region, which shares many similarities with the Illawarra region, underwent similar structural changes as a result of the decline in the steel making industry. However, the region has since grown as a result of the strength of the region's mining sector, tourism associated with the Hunter wine region, increased port activity and population growth in many coastal areas of the Hunter.

The diverse experiences of these regions highlights that there are many different potential successful models of regional development which regions can follow. In many cases the development path which a region follows is dependent on the natural advantages the region possesses. This forms the basis for focusing on a factor which would then dictate the development path a region follows.

Consider regions like the Gold Coast. The Gold Coast possesses significant natural beauty which has led to the development of the tourism industry. Newcastle and Townsville are close to natural resources which creates a natural advantage in mining. Typically, infrastructure is then developed to leverage a region's natural advantage e.g. airports for tourism in the Gold Coast and Cairns or heavy rail and ports for Newcastle and Townsville.

The relative success of regions in attracting people can in turn impact the cost of living. For example, the cost of housing in the centre of the Gold Coast has risen sharply in the past, partly due to hotel demand (although has moderated more recently), while house prices have risen sharply in some mining towns such as Port Headland in recent years. This can in turn impact the relative attractiveness of some areas.

Appendix E: Current economic development strategies in the Illawarra

A number of major regional development strategies currently exist for the Illawarra, including the:

- Regional Action Plan for the Illawarra, from the NSW Department of Premier and Cabinet;
- RDA Illawarra Regional Plan 2010-2015; and the
- Illawarra Regional Strategy, from the Department of Planning and Infrastructure.

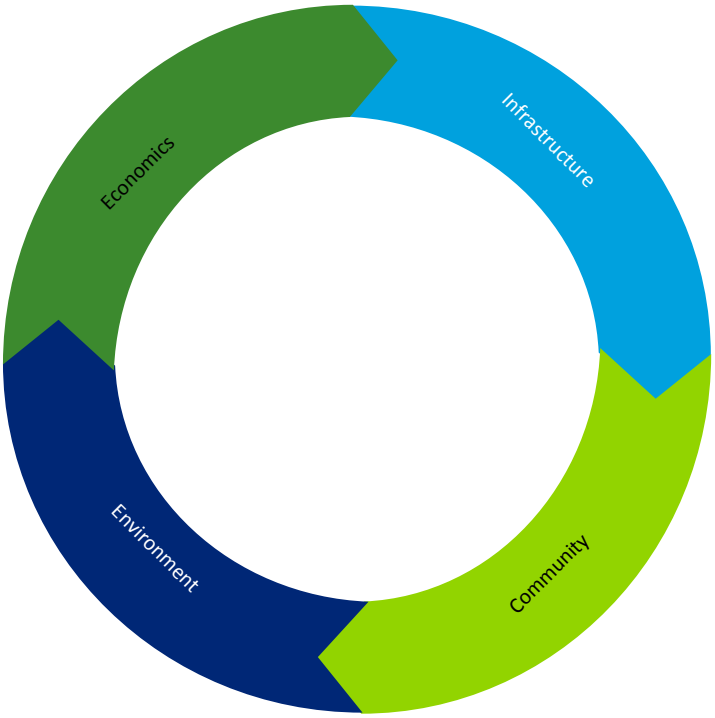
In general, the priorities identified in each of these regional plans can be can be classified into four main themes:

- economic development;
- infrastructure improvements;
- community development; and,
- environmental sustainability.

In many ways these components are inter-related. Economic development results in increased demand for infrastructure, which in turn enhances accessibility promoting community development. As a community develops and grows, pressure is placed on the natural environment resulting in heightened concern about environmental issues. This environmental awareness can in turn impact the way and areas in which economic development occurs over time. In summary, it is important to recognise that while some aspects of regional development can produce virtuous cycles, some goals such as improving the environment and economy, or achieving development and community amenity can be in conflict, especially in the short term.

The interconnectedness of the four priorities is displayed graphically in Figure E.1.

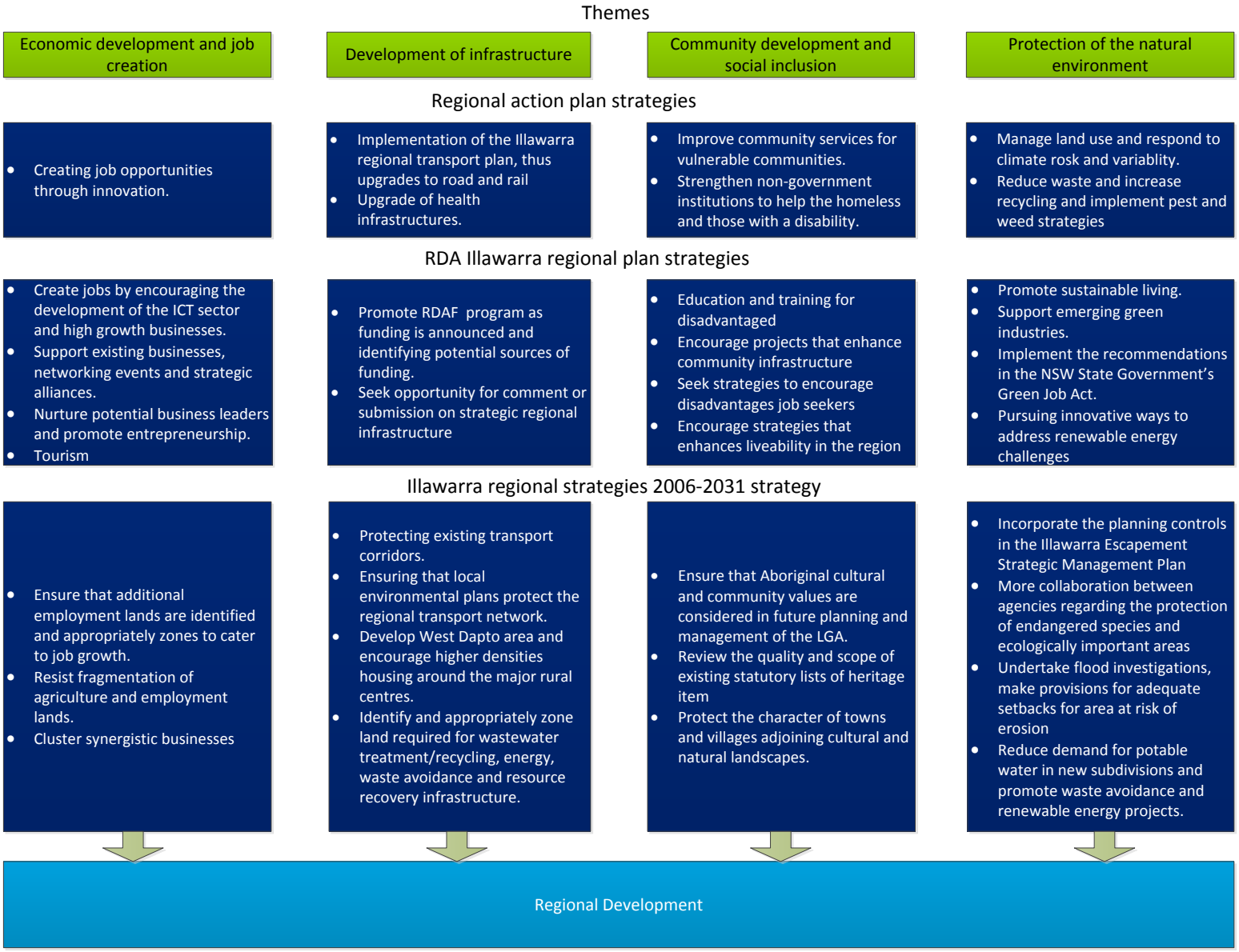
Figure E.1: Inter-related themes of regional development



Source: DAE

Figure E.2 shows how each of these themes has been considered in the three major regional development strategies currently applying to the Illawarra.

Figure E.2: Summary of strategies



Regional Action Plan for the Illawarra

Regional Action Plans focus on immediate actions the NSW Government will take to improve outcomes in each region in response to priorities raised by local communities. The regional action plans complements longer term strategies for the region and the whole of State. The Regional Action Plan is a two year plan which commences in December 2012. Delivery of the Regional Action Plans will be driven by government agencies.

The specific Regional Action Plan for the Illawarra complements the NSW 2021 plan. The Regional Action Plan allocates priorities across a range of NSW government agencies. For the Illawarra region, the NSW Government's focus is to:

- revitalise the economy by attracting new industry, supporting businesses and creating new jobs;
- provide accessible, efficient and integrated regional transport;
- deliver infrastructure to support population needs;
- deliver improved health and community services particularly for vulnerable communities; and,
- safeguard the natural environment.

In revitalising the economy, the plan emphasises attracting new industries and harnessing opportunities from growth sectors such as ICT. In delivering infrastructure the priorities are to implement the Illawarra transport plan to improve road infrastructure, bus and rail services and freight movement in order to make transport more accessible and affordable. The strategy for community development is to enhance service delivery to vulnerable members, implement the NSW Ageing Strategy, and to build the capacity of NGOs. With regard to the environment, the plan emphasises waste reduction and improving the management of land use.

RDA Illawarra regional plan 2010-2015

The RDA Illawarra regional plan for 2010 to 2015 is RDA Illawarra's strategic plan to further develop Illawarra. The plan is used by the Australian Government to provide a regional perspective for the formulation of national policies. The plans identify regional infrastructure needs and are valid for a five year period. These plans are reviewed annually to ensure they respond to emerging trends in the region.

The plan documents its vision and direction for the region and provides a summary of current economic conditions. The initial plan was launched in July 2009 and has been revised in October 2011 and September 2012, following the downsizing of BlueScope Steel at Port Kembla and the flow-on effects in the region.

The primary goal of the plan is to improve economic, environmental and social outcomes for the people and organisations in the Illawarra region. To achieve this goal RDA Illawarra identified eight regional priorities:

- broadband/ICT;
- business growth;

- green jobs Illawarra;
- innovation;
- leadership;
- strategic infrastructure;
- social inclusion; and,
- tourism.

The eight priorities above can be considered in terms of the four interrelated themes identified above, of economic development, infrastructure improvement, community development and environmental sustainability:

- In supporting **economic development**, the plan emphasises innovation, ICT and other high growth businesses as a channel to diversify the economy. There are plans to develop internal capabilities in the region to support future needs of these emerging industries.
- In delivering **infrastructure** the priority is to implement existing road plans and to lobby for more funding for important infrastructure.
- To address **community development** the emphasis is on social inclusion and to enhance social infrastructure and employment opportunities. This is achieved through the training of the vulnerable.
- With regards to the **environment**, the plan emphasises environmental sustainability in the form of green jobs. The plan also encourages the pilot of innovative green technology and to promote sustainable living initiatives.

Illawarra regional strategy 2006-2031

The Illawarra regional strategy, 2006-2031 was written by the then Department of Planning in 2006 to devise a strategy to support the development of the Illawarra region. This plan is separate to the Regional Action Plan discussed above. The purpose of the document was to devise an overarching development strategy to support economic and employment growth in the region. The result was a high level document which addressed a number of areas including:

- economic development and employment growth;
- regional transport;
- housing and settlement;
- natural environment;
- natural hazards;
- water, energy and waste;
- rural landscape and rural communities; and,
- cultural heritage.

Within each of these categories there were a significant number of actions which the government planned to undertake. We note that in a number of categories such as economic development and employment growth there have been a number of changes since this strategy was released. The plan focussed on ensuring that measures are present to facilitate further development of the region. Some examples of initiatives that were

mentioned were better zoning and better communication between the local government and the state.

Key themes that emerge from past development strategies in the Illawarra

As illustrated in Figure E.2, there are four key themes that have emerged in recent regional development strategies in the Illawarra:

- Economic development and job creation;
- Development of infrastructure;
- Community development and social inclusion; and
- Protection of the natural environment.

This section discusses these themes in greater detail and highlights some of the strategies within each theme noted in the three main regional strategies. Insights from overseas studies and Australian studies on each of these themes are also discussed.

Economic development and job creation

Current themes

The strategies propose a number of approaches to economic development for the Illawarra region. The two main themes emerging from recent regional development plans is to diversify away from mining and manufacturing by moving into ICT and other sectors considered as high growth and innovative, as well as support existing businesses in these areas. The latter may come in the form of training, education and/or networking events.

In the past, Illawarra has been dependent on the mining and manufacturing sectors, in terms of both employment and output (industry value add). As a result the long term decline in manufacturing employment and peaking of the mining boom have potentially far more serious implications for the Illawarra region than for other regions in NSW.

Given that unemployment in the Illawarra region is currently, and has been historically, higher than both the State and national averages, diversification of the economy represents a key avenue for future job creation. Job creation is important because it ensures that the region can retain people in jobs and can generate demand for new businesses.

The emphasis on ICT and innovation is appropriate since Illawarra has the appropriate physical capital:it is amongst the first sites to receive access to the NBN, and the University of Wollongong is a major source of ICT graduates. This provides the region with a unique opportunity to capitalise the benefits of ICT from the NBN. However, to develop the region into an ICT hub, incentives will be required to channel investments that develop the appropriate human and physical capital.

Insights from overseas studies

What we can ascertain from overseas studies is that many like industries tend to be concentrated together. For example, North Ryde in Sydney has established itself as an 'IT

hub' by attracting many big named (and up and coming) 'high tech' firms. Thus one of the key takeaways from the studies is that incentives must be targeted towards "key players" in the industry so that they are willing to establish themselves in the region. Once this is achieved, minor players tend to congregate around the major players due to the economies of agglomeration.

A precondition to achieving this is that appropriate physical infrastructure must exist and human capital must be available to support the needs of the industry. From this perspective the NBN plays an important role in providing the appropriate physical capital.

Human capital may present itself as an issue for the Illawarra region since IT workers are relatively underrepresented in the Illawarra region compared to the State average. From this perspective the University of Wollongong is likely to play an important role in supporting growth in human capital in the region.

The growth of ICT is also expected to lead to other positive externalities. In particular, it is expected to facilitate the growth of other related knowledge services sectors. According to NSW Trade and Investment figures quoted in Advantage Wollongong (2011) knowledge services employed 4,500 people in 58 locations in the Illawarra. The expansion of the ICT sector could be a catalyst for growth in this sector and accelerate the agglomeration process.

Natural amenities were also touted as being able to assist regional development. If a region is attractive for the employees of the firm employees are more likely to stay in the region and thus reinforce community development. Furthermore, it could also support the human capital needs of the developing ICT industry.

Development of infrastructure

Current themes

The strategic plan has major plans to improve road and rail infrastructure into and out of the region. There are also plans to improve the health and social infrastructure in the region. The development of existing infrastructure is an important issue for two reasons:

- it reduces the perceived distance between the Illawarra region and other major centres as travel time drops; and,
- it improves market access for residents of the Illawarra region and those accessing the Illawarra.

Insights from overseas studies

Reducing the perceived distance and improving market access would make a region more attractive to potential residents. Distance also matters because in many industries face-to-face contact matters. Thus the time it takes to travel to a major centre will impact on the region's development and its ability to establish itself as a hub for certain industry. The argument here is also related to market access. If a region is more accessible relative to other centres it makes it more likely to develop and flourish. Thus a potential business would have fewer reservations in establishing itself in that region. For example, the presence of major ports like Port Kembla can be a major drawcard to businesses which predominantly export.

To address this issue an analysis by the then Department of Transport and Regional Services (2007) of the Sydney to Wollongong corridor identified a number of longer term issues with transport links and expansion of the port including:

- limited scope to increase rail freight flows on the coastal line due to priority being given to passenger trains;
- congestion on the road network between Heathcote and Blakehurst in Sydney;
- congestion between the Gwynneville interchange and the northern tip of Mount Ousley Road; and,
- the expected impact of the expansion of Port Kembla on heavy vehicle numbers in the region.

In addition, the State Infrastructure Strategy (Infrastructure NSW, 2012) noted that commuter rail transit times between Sydney and Wollongong remain relatively long. These issues highlight the key transport infrastructure issues facing the Illawarra.

Community development and social inclusion

Community development and social inclusion is important to ensure that the region is better connected. Developing a sense of community can be important in building social capital and networks among residents. These networks can help residents identify employment and business opportunities in the region. As part of the current regional strategies there are plans to train the unemployed and disadvantaged so they are able to participate in the labour force which would help improve social inclusion in the region.

The second part of the strategy is to improve the liveability of the region. Improving liveability makes the region more attractive for potential residents. As more people are attracted to the region this would enhance regional development.

Previous studies have shown that improving density, particularly around major train stations and the city centre, is seen as a way of improving liveability. According to the Illawarra Urban Development Program Update 2012, the region is aiming for a 50:50 split between multi-unit housing and detached housing. Over the last five years, the region has been able to maintain this 50% split and if these trends continue this will slowly lead to a fall in the region's proportion of detached housing. It is expected to contribute to improved liveability by promoting housing close to existing centres.

Protection of the natural environment

The regional development strategies highlight two important initiatives for protecting the natural environment. The first is the promotion of ecologically sustainable practices for businesses and the community such as reducing waste, increasing recycling and implementing pest and weed strategies. The second channel is to provide incentives for businesses to pursue innovative ways of piloting or promoting ecologically sustainable practices. In this case, innovation in technologies and green jobs is encouraged.

Protection of the natural environment also helps to preserve the natural beauty of the region. If these areas are protected and sustainable practices are promoted this would ensure that the Illawarra remains an attractive location to visit or reside. In particular, the international studies discussed earlier have shown that sea/tree change can assist in promoting regional development.

The natural environment of the Illawarra region also helps make the region an important drawcard for domestic tourism. The Illawarra region (covering the Wollongong, Shellharbour and Kiama LGAs) hosted around 2.5 million domestic visitor nights or approximately a quarter of domestic visitor nights for the broader South Coast region in 2012 (TRA 2013). Forecast growth in international visitor arrivals to Australia also means there is significant potential to grow international tourism in the Illawarra region over time.

Human Capital

Human capital is one of the areas identified in the literature as a key driver of regional development. Whilst it is true that the University of Wollongong and TAFE produce a large number ICT graduates, on the whole literacy levels and numeracy levels in the region remain below the state average.

According to the Priority Employment Area survey, between 10% and 13% of year 9 students in the Illawarra region did not meet the minimum standard for reading compared to the NSW average of 6%. For numeracy, the equivalent figure is between 7% and 10% compared to 6% for NSW. This is reinforced by the fact that across the LGAs that make up the Illawarra between 55% and 69% of those aged 25 to 34 have completed year 12, which is again lower than the state average of 75%.

Another impediment to the growth of the ICT sector is that only 15% to 31% of those aged 25 to 34 across the LGAs that make up the Illawarra have completed a bachelor degree compared to 37% for NSW as a whole. The higher figure was for the Wollongong LGA reflecting the relatively higher proportion of high skilled residents living in this LGA. These lower rates of university qualifications (particularly outside Wollongong) have the potential to limit the growth of high skill services sectors that require employees with bachelor's degrees. Thus human capital strategies are also important to complement the future needs of the industry.

In developing the appropriate human capital it is expected that the University of Wollongong (UOW) would play a critical role in ensuring the needs of employers are met. UOW is a significant economic institution in the region. In 2012 its direct, indirect and induced contribution to Gross Domestic Product was estimated to be $1.12 billion (UOW 2013). UOW's input to the development of Australia's stock of human capital was also estimated to be $1.34 billion (UOW 2013).

Insights for economic development in the Illawarra

The literature provides some directions and considerations in which regional development policy can progress.

Agglomeration

Overseas studies consistently highlight that agglomeration matters. The main implication of this is that for example if the Illawarra wants to develop the region as an ICT hub, then it would need to attract key industry players into the region. Attracting key firms into the region can in turn attract other firms and thus accelerate regional development. The key lesson is that the incentives must be broad enough to target key firms and in the long run develop a broad based ICT industry.

Agglomeration is a key consideration for economic development of the region since it will determine to what degree the strategy of attracting an industry such as ICT is successful.

Distance

A second insight from the overseas studies is that distances matter and it is important to close that distance. In this context distance can refer to both physical distance and perceived distance. If either the physical distance (say, through better infrastructure) or the perceived distance (say, through better connectivity) is reduced, this makes the region more attractive for potential businesses and residents. Related to this is the idea of accessibility to markets. If the region is more accessible to other markets, then the region itself will become more attractive to prospective investors (and residents) which may ultimately lead to accelerated development.

This is also related to costs (transport costs, cost of doing business and establishment costs, as well as perceived costs such as the opportunity cost of residing in one region rather than another). In short, costs continue to matter. If an area is less convenient and less accessible it is less competitive relative to metro area. Thus for the region to be attractive the costs in the region must be lower.

In the case of the Illawarra, while it is further from central Sydney than most of the Sydney greater metropolitan area, it is closer to Sydney than most other major metropolitan areas. Further, the region's natural amenity may enhance its competitiveness in the sense that the attraction of residing or doing business in the Illawarra may be greater than other Sydney based regions.

In addition to economic development, distance can also assist community development. In short, as distance increases people are less likely to move to the region since it is less accessible to other sectors and regions which can inhibit community development. However, reducing travel times and encouraging greater development in parts of the region that are closer to major markets can help promote community development.

Lifestyle

The overseas studies have also highlighted that natural amenities can assist regional development. The Illawarra region has been endowed with significant natural beauty. Naturally people prefer to live in areas that are attractive, and this could also be another drawcard for those looking for a sea-change.

The fact that the Illawarra possesses significant natural beauty also lends itself to tourism opportunities and the development of a tourism industry. Relative to other comparable regions the Illawarra has a significant comparative advantage as it is relatively close to Sydney. This in turn is expected to also attract population growth as Sydney residents see the Illawarra as a home away from home.

The natural beauty of the region highlights the need to protect the environment as it is a major drawcard for potential residents as well as tourists. Furthermore, in attracting people to the region, natural amenity can help lead to further community development. However, community development will need to be appropriately balanced with environmental considerations.

Competitiveness and attracting innovation

Under the OECD's 'new paradigm' for regional development, competitiveness plays a key role in determining the development status of the region. Competitiveness can come in the form of cost advantage or the ability to offer a unique product.

The policy framework is to tap into underutilised regional potential through regional programming. However, in many cases leadership and entrepreneurial skills are required to develop the region. These types of people are able to easily identify the underutilised resource and capitalise on it. This is one rationale as to why the encouragement of entrepreneurs into the region and the nurturing of business leaders is justified. It is these entrepreneurs that can recognise these opportunities which would assist in developing the region.

Competitiveness is also paramount to lowering costs aforementioned lower cost tends to attract firms. As more firms establish themselves in the region this could be used to reinforce any economies of agglomeration in the region.

A unified policy framework

Most importantly, the OECD's new framework encourages all stakeholders to be involved. All potential employees need to get involved and all levels of government need to be involved in developing policies to attract preferred industries into the region and to nurture those in the region so that the firms can continue sustainably. Beyond that the government has to ensure that costs are sufficiently low so it is attractive for firms to be in there. Other businesses and residents need to be involved to ensure that they can support the plan and create a hospitable environment for the potential entrant. The challenge is to formulate the correct policies so that as a whole the region can develop in a well-rounded manner and in the right direction.

Future trends and the digital economy

We conclude with the observation that just as regional development policies have reflected changing views on economy and society over time, this will continue into the future. For example, as environmental awareness has risen in recent decades, environmental strategies have played a bigger role in regional development.

In coming years, we expect that digital economy considerations will play an increasing role in regional development strategies. This will not simply manifest itself as a factor in considering business investment and changes in employment and skill mix, but also in other trends such as telework, e-commerce and e-service delivery. With so much rapid change in this area, regional development strategies will need to be flexible to changes from these trends to stay relevant in the medium term.

Appendix F: Description of existing regional strategies

Regional Action Plan

Economic development

The Regional Action Plan for Illawarra and the South Coast (Department of Premier and Cabinet 2012) notes that in order "to broaden the economic base and to build a sustainable and resilient economy we need to:

- Support programs and investment that create long-term, sustainable jobs for the region;
- Leverage the existing industry base and assets, including the Port of Port Kembla and Albatross Aviation Technology Park;
- Support existing businesses, attract new industries and harness opportunities from growth sectors such as the ICT industry;
- Develop economic diversification strategies; and
- Provide education and training opportunities to match skill needs of new and existing industries, especially for young people."

Specifically, the Regional Action Plan includes a number of priority actions to create job opportunities in the Illawarra region including:

- the NSW Government partnering with the Commonwealth Government to deliver the Illawarra Region Innovation and Investment Fund;
- establishing a Tier III Data Centre in Wollongong;
- provide services to support individual business investment projects through NSW Trade and Investment; and
- provide payroll tax rebates for eligible workers through the NSW Jobs Action Plan.

Other priority actions to revitalise the NSW economy under the Regional Action Plan include: leveraging existing industry base and assets, in particular Port Kembla; providing support for business and events; develop economic diversification strategies; and use Industry Action Plans to attract new industries and harness opportunities from growth sectors. The final priority to revitalise the economy is to ensure that educational institutions including TAFE Illawarra will be working with the local community to ensure that the labour market can support the needs of local businesses.

Infrastructure improvements

Under the Regional Action Plan there are three major infrastructure priorities. The first is to provide accessible, efficient and integrated regional transport for both passengers and freight. The second is to provide sufficient infrastructure to support the needs of the

population and to ensure that residents and businesses has access to services. The third is to deliver improved health and community services.

A priority action to provide accessible and efficient transport in the region is the development and implementation of the Illawarra Regional Transport Plan, a long term transport master plan for the region. Other priority actions identified in the Regional Action Plan to improve transport in the region include upgrades to road infrastructure, upgrading train stations such as Kiama train station, bus and rail services, improving freight movements and providing accessible and affordable transport for older and socially disadvantaged population.

To deliver infrastructure to support population needs, priority actions include preparing regional growth plans that incorporate land use, infrastructure and transport planning. The Regional Action Plan clearly sees this as being interrelated with economic development, noting that: "infrastructure planning and projects are required in the region to stimulate economic growth, support urban development and improve access to services." As a result, a further priority action is to revitalise City Centres to create jobs, commercial and retail opportunities. To address this priority, "The NSW Government will work with local councils in the region to review development controls for key centres".

A further priority action is to coordinate the planning and infrastructure for new urban land release areas.

To deliver improved health and community services, particularly for vulnerable communities, the Regional Action Plan identifies the need to deliver improved health infrastructure and services, strengthen local health services, enhance the delivery of mental health services and support the Illawarra Health and Medical Research Institute. Other priority actions focus on planning for the region's ageing population and to enhance service delivery to support and strengthen vulnerable families and individuals.

Community development

To ensure that the vulnerable are served, the Regional Action Plan notes that the NSW Government will continue to implement the NSW Ageing strategy (2012) and enhance service delivery to support vulnerable families and individuals through Family Case Management. Other community development priority actions include addressing the rate of homelessness in the region through the implementation of the NSW Homelessness Action Plan (2009) which is the blueprint for a prevention and early intervention approach to reduce homelessness in NSW. Another priority action is to further build the capacity for non-government organisations and communities to deliver key human services. A further priority action is to increase the level of service provided to people with a disability.

Environmental sustainability

The final priority identified in the Regional Action Plan is to safeguard the natural environment. To address this issue the government plans to manage land use impacts on the region's natural resources and develop tools to help local communities respond to climate risk and variability. Further priority actions seek to reduce waste, increase recycling and implement pest and weed strategies.

RDAI regional plan

Economic development

The economic revitalisation in the RDA Illawarra Regional Plan is very much geared towards diversifying the economy and reducing its reliance on traditional manufacturing and mining. In this category, there are four priorities:

- broadband/ICT;
- business growth;
- innovation; and
- leadership.

The emphasis on broadband/ICT is one of the cornerstone priorities of RDA Illawarra's plan to revitalise the economy. The reason for this is twofold: first, RDA Illawarra, notes that the Illawarra region produces almost half of all ICT graduates in NSW; and second, it is also one of the first sites which will receive the NBN. This opens up new possibilities such as teleworking that would further develop the ICT sector in the region. This becomes one channel in which the Illawarra region can diversify away from manufacturing and mining. RDA Illawarra believes that this could potentially be a large growth sector in the region.

Some of the flow-on effects are that it could improve the delivery of government services, improve health outcomes, improve educational resources and training and environmental outcomes. High speed broadband is also expected to facilitate teleworking and improve connectedness which may assist the region's competitiveness.

The second prong of the strategy is to enhance business growth. To address this RDA Illawarra plans to focus their strategies on developing the advanced manufacturing, green/renewable, health and social assistance and knowledge services sector. Again the key sectors mentioned are significantly different from the traditional sectors which the Illawarra region has relied upon. To achieve this RDA Illawarra proposes the following actions:

- expand the Economic Gardening High Growth Business Program;
- continue support for the Small Business Clubs operating across the region;
- seek opportunities to attract and support small to medium enterprises and micro-businesses;
- support existing and emerging Social Enterprises;
- seek opportunities for training and education for unemployed and disadvantaged community members in employment growth areas; and
- lobby for infrastructure required to attract new industry to the region.

In general, these points can be summarised as seeking new opportunities and supporting the current stock of businesses. While business growth is important the emphasis is also to ensure that growth is environmentally friendly and can create green jobs. To encourage green jobs, businesses will be encouraged to be more sustainable in their operations.

To complement the objective of targeting ICT firms and the use of broadband, RDA Illawarra's third strategy is to focus the region on innovation. The focus on innovation is critical to ensure that the region can capitalise on its high speed broadband capacity, and to

ensure that the region has the capacity to develop sufficient human capital to meet the needs of industry.

RDA Illawarra believes that the University of Wollongong would play a major role in this strategy. It notes that the University is a significant source of innovation for the region, but also plays a major role in ensuring that the region has enough human capital to meet the needs of industry. Thus the University could be used as an engine of innovation for the region which could then flow onto the use of, or development of, innovative technologies. To encourage innovation RDA Illawarra plans to:

- assist the Innovative Regions Facilitator to deliver key elements of its Regional Innovation Plan;
- assist in the creation of systems and strategies that support the development of innovative industries in the region, including the adoption of an 'Innovation Ecosystem' framework for industry development;
- develop and implement projects that aim to build business capabilities and entrepreneurial capacity;
- facilitate regional business collaboration, including innovative alliances aimed at opening new markets for Illawarra SMEs; and
- facilitate the flow of innovative information.

Infrastructure improvements

To support the economic strategies, infrastructure must be available to ensure that they are achievable. For example, the availability of high speed broadband is crucial to the achievability of strategies in relation to ICT and innovation.

In addition to high speed broadband, RDA Illawarra has identified other pieces of infrastructure which are important to economic and community development. One such example is the Maldon to Dombarton rail link which RDA Illawarra identifies as a critical piece of infrastructure to Port Kembla. The Maldon to Dombarton rail link is expected to play a significant role in handling NSW's movement of import and export freight. Another example is the High Speed Rail Link.

To ensure that the plans are completed in a coordinated manner and that maximum benefits are derived, RDA Illawarra supports the completion of an Integrated Regional Transport Strategy. It suggests utilising strategic modelling and the latest technology to ensure public transport services perform at the highest possible level. To achieve these goals RDA Illawarra suggests:

- promoting RDAF program as funding rounds are announced;
- identifying other potential sources of funding for regionally strategic projects;
- working with project proponents to ensure projects align with the RDA Illawarra Regional Plan;
- working with successful applicants to ensure project implementation and completion; and
- seeking opportunity for comment or submission on strategic regional infrastructure.

Community development

Improved infrastructure would improve accessibility in the Illawarra region and enhance community development. To further promote community development, social inclusion is encouraged. In the past, the region had higher unemployment compared to NSW. RDA Illawarra acknowledges that there are several areas in the region that are of significant locational disadvantage, thus many members in these communities face barriers to social inclusion. RDA Illawarra believes that social inclusion is important to promote economic growth and job creation in the region. To address this, RDA Illawarra proposes to:

- seek increased opportunities for education and training in the region, particularly for the region's young people and its large number of unemployed;
- encourage projects that enhance the region's community infrastructure;
- seek strategies for increasing employment opportunities, including the inclusion of disadvantaged job seekers in employment growth initiatives;
- encourage and support innovation through social enterprise and social business opportunities;
- promote strategies that enhance the liveability of the region for our residents, including, but not limited to, enhancing transport, age friendly environments, youth facilities and community facilities;
- encourage projects that build on community strengths and on the community services infrastructure of the region; and
- ensure all community members have an opportunity to have their voice heard on matters of regional significance.

Environmental sustainability

RDA Illawarra has made environmental sustainability a key priority as part of its green jobs initiative. In addition to the encouragement of green jobs, RDA Illawarra proposes to provide incentives for firms to pilot innovative sustainable technologies.

To achieve this it will integrate the research and development capacity of industry and leading institutions such as the University of Wollongong, with the application of those green technologies by both existing and new industries across a range of sectors including manufacturing, renewable energy generation and construction. Other actions which RDA Illawarra plans to take to ensure it meet its green credentials include:

- implement and further scope the recommendations in the NSW State Government's Green Jobs Illawarra Action Plan;
- pursue other innovative ways of addressing renewable energy challenges;
- seek opportunities to promote sustainable living initiatives; and
- support emerging green industries and organisations.

Finally, RDA Illawarra acknowledges that the region is endowed with significant natural beauty and as part of their development plan will promote tourism in the region. To achieve this it proposes to:

- promote Illawarra as a preferred conference and events destination;
- host national and regional conferences and events;
- lobby for the necessary infrastructure required to support tourism in the region; and

- develop innovative ways to promote the region to both the domestic and international markets.

Illawarra regional strategy

Economic development

In the Illawarra regional strategy, a key focus was to ensure adequate land is available to facilitate economic development. The focus was ensuring that councils maintain the supply of land to cater for job growth and appropriately zoned to cater for job growth. Furthermore, the regional strategy recommended that councils should cluster synergistic businesses by consolidating them in existing centres.

Infrastructure improvements

In the same vein as economic development, in the case of infrastructure the Illawarra regional strategy seeks to protect existing transport corridors and ensure that local environmental plans recognise and protect the regional transport network. Furthermore, the strategy notes that land use planning decisions should consider the transport access implications.

Community development

For housing and settlement, the Illawarra regional strategy aims to ensure that there are sufficiently zoned regions to facilitate higher density housing to accommodate the expected increase in population in the region.

The main strategies proposed for increasing the supply of housing identified in the strategy were to develop the West Dapto area to deliver 19,350 mixed dwellings and encourage greater utilisation of available infrastructure though higher densities around the major rural centres.

Environmental sustainability

For the natural environment, the NSW Government wanted Wollongong City Council to incorporate the planning controls recommended in the Illawarra Escapement Strategic Management Plan into its local environmental plan. More collaboration between the councils and the Department of Planning was also proposed, especially in relation to the protection of endangered species and ecologically important areas.

To mitigate natural hazards, the NSW Government recommended that local governments undertake flood investigations and make provisions for adequate setbacks in areaa at risk of erosion. Local environmental plans would include minimum standards for rural and environmental protection zones and provisions to limit dwellings in rural and environmental zones.

With regard to water, energy and waste, the NSW Government recommended that local government collaborate more with the State Government to identify and appropriately zone land required for wastewater treatment/recycling, energy, waste avoidance and resource recovery infrastructure.

On cultural heritage, the Illawarra Regional Strategy actions seek to ensure that Aboriginal cultural and community values are considered in future planning and management of the local government area. The strategy also notes that the Department of Planning and councils should review the quality and scope of existing statutory lists of heritage items and ensure that other important items are included. Finally the strategy also notes that local environmental plans should include provisions to protect the character of towns and villages and adjoining cultural and natural landscapes.

Appendix G: Forecast methodology

This report includes forecasts for employment levels by industry and occupation, and post-school qualification requirements associated with these employment levels. This appendix sets out the methodology applied in developing these forecasts.

Employment forecasts

State level forecasts

Deloitte Access Economics has a well established framework for projecting employment demands by industry and occupation over time. This framework can produce forecasts to the 3-digit ANZSIC industry classification level and the 4-digit ANZSCO occupational classification level, consistent with labour force time series data released by the ABS. The forecast framework is as follows:

- We develop forecasts for key macro variables using the Deloitte Access Economics Macro (DAEM) model, a small, dynamic model of the Australian economy which we regularly use for our macroeconomic forecasting. These key macro variables include components of final demand (such as categories of private consumption and investment) and total employment.
- Growth in employment by industry is forecast using known relationships between components of final demand and industry employment (based on input-output data). For example, if the investment forecasts suggest that residential and construction are gaining strength, then the construction industry will gain strength. Or, say, if rural exports are lifting, then the farm sector is similarly seen lifting.
- A counterfactual estimation is conducted on historical data to determine actual employment growth not picked up by this methodology, for example due to changes in worker productivity and structural changes in the economy. Corresponding adjustments are made to the forecasts.
- Forecasts for industry employment (at the three digit ANZSIC industry level) are translated into occupational employment forecasts (at the four digit ANZSCO occupational level) using 2011 Census data which shows the occupational employment share for each of the industry groups examined. For forecasts, these shares are allowed to change over time.

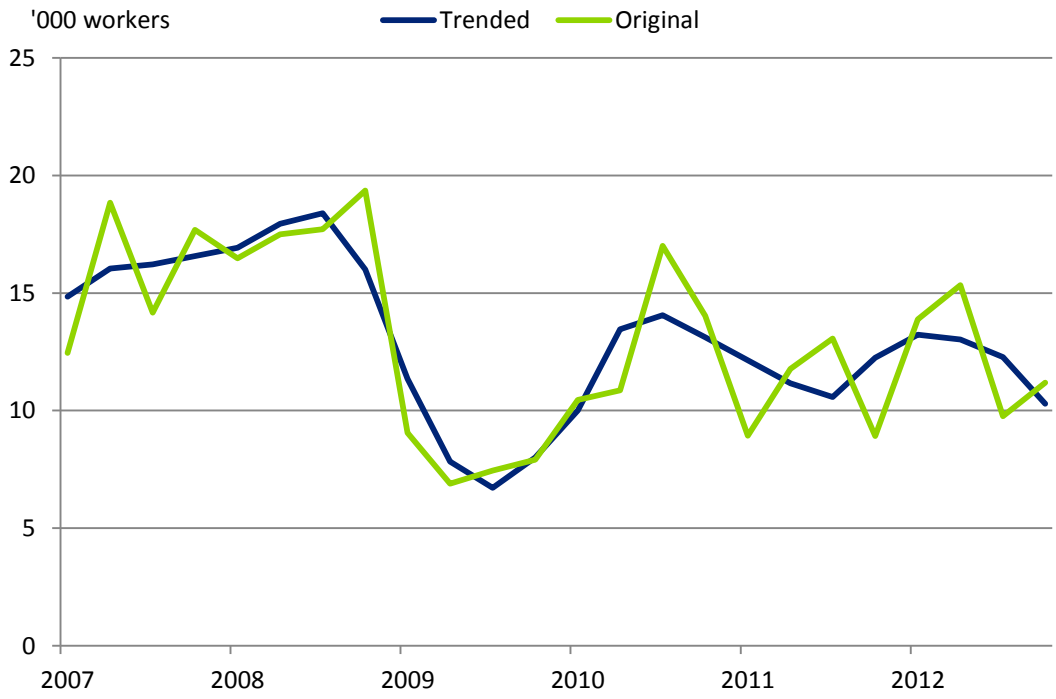
Regional (Illawarra) forecasts

At the regional level, initial industry level forecasts are derived by first taking a logarithmic extrapolation of each region's share of State employment. An adjustment is then made to ensure that the region's implied unemployment rate is in accordance with historical averages given the expectations for the region's population and labour force growth. Finally, the resulting estimates are normalised to the State total derived from the procedure described above.

An inherent difficulty in any regional based modelling is variability in the underlying data. This is especially the case with historical employment data, which are estimated based on an Australia wide sample of approximately 26,000 dwellings, which are then weighted to produce population estimates. At a regional level, any change in that sample size form one quarter to the next has the potential to cause significant changes in the underlying employment estimate.

Given this, historical ABS data are first converted into a 'trended' series, using a Henderson moving average (similar to how the ABS creates trended series). To demonstrate this, Chart G.1 compares the original and the trended series for manufacturing employment in the Illawarra region. By using the trended rather than the original series we can have greater confidence that any change in the region's share of State totals reflects a genuine change and is not merely caused by sampling issues in the underlying data.

Chart G.1: Manufacturing employment in the Illawarra, original vs trended



Source: ABS, Deloitte Access Economics

That said, the volatility of the underlying data is so extreme that even after the trending procedure, outliers in the historical data are still able to influence results. Therefore, as a final step, manual adjustments are made to regional employment estimates (at the industry level) to strip out the effect of outliers.

Finally, occupational employment forecasts are generated based on known and projected occupational shares of each industry, with these being based on the State level forecasts described above.

Detailed industry and occupational forecasts

Detailed (3 digit ANZSIC and 4 digit ANZSCO) forecasts at a regional level are made on the basis of the 3 and 4 digit forecasts at a State level, and the 1 digit forecasts at the regional level discussed above.

The first step is to create detailed (3 and 4 digit) estimates by combining the known 1 digit total with the implied occupational and industry shares from the 2006 and 2011 Censuses. This is conducted first at the regional level, with the regions then summed to create a preliminary 'NSW' estimate.

The second step is to normalise the estimate derived above with the 3 and 4 digit State level forecasts derived earlier in the modelling process. This is done by an iterative correction process, which estimates the 'error' in the regional estimates (by dividing the State estimate by the sum of the regional estimates), and then applies that error to the original estimates. By doing this process over and over, the error is gradually reduced until it is close enough to zero.

This normalisation process ensures that structural changes that occur at a State level – say, an ageing population causing aged care to account for a greater share of health care employment over time – equally applies at a regional level.

The third step, similar to the 1 digit forecasts, is to apply manual adjustments to the 'mechanistic' forecasts as desired.

Skills (post-school qualification) forecasts

Skills for the purpose of this report are examined on the basis of employed person's propensities to hold post-school qualifications.

To assess the future qualification implications of labour market demand, we utilise **a profile of the typical qualification mix that is associated with employment in specific industries and occupations**. This represents recent information on average propensities to hold qualifications – in most cases these are not necessarily a strict requirement in order to undertake a particular job.

The historic profile at the four-digit ANZSCO level is drawn from the 2011 Census. However, it is updated to reflect the occupational profile shown at the one-digit ANZSCO level which is contained within the 2012 ABS *Survey of Education and Work*.

When combined with the employment forecasts for the Illawarra region this analysis gives a good indication of the skill needs of the Illawarra's workforce through time.

Structural change

Over time, economic growth in Australia and other rich countries tends to be increasingly dependent on innovation and productivity growth, rather than on endowments of factors of production or natural resources. Also, growth in wages and other input costs, as well as increased competition from both domestic and foreign sources, will force businesses to squeeze more and more output out of their existing workforce. In other words, in order to

stay competitive, workers today need to be more highly skilled than similar occupations fifty years ago, and this trend is expected to continue into the future.

As a result of structural change the methodology assumes a certain degree of 'up-skilling' through time. 'Up-skilling' reflects a number of factors:

- structural change within industry sectors;
- structural change within the labour market as a whole; and
- a general trend of workers to hold more than one qualification, either through 'skills deepening' or 'skills broadening'.

From the Survey of Education and Work we have derived an estimate of the share of people in a given occupation who held a qualification over the period from 1997 to 2012. The data show a notable rise in the share of workers with post-school qualifications over time – a trend that the model assumes will continue across the projection period.

Assessing and projecting the share of the employed workforce who hold post-school qualifications is one issue, while assessing and projecting the total number of post-school qualifications held by those employed is another. The latter allows for the fact that many people do hold more than one post-school qualification.

The propensity to hold multiple qualifications is separately examined for:

- skills deepening – where individuals have attained a higher level qualification; and
- skills broadening – where individuals have attained a further qualification at the same or lower level.

Replacement demand

To assess additional skill needs over time in an economy it is necessary to account for the fact that the workforce is not stagnant. In any one period, new workers will enter and existing workers will leave.

So if the stock of workers from one period to the next is expected to grow by 10,000, not only will the economy need to create 10,000 jobs to match that projected growth, but it will also have to create new jobs to replace those who have left the workforce. The latter is termed replacement demand.

For the purpose of the analysis provided in this report replacement demand is derived exclusively from the propensity for individuals to retire within specific occupations.

The new entrant needs to match the skill set of the retiree (including the propensity for that retiree to have held post-school qualifications), but also needs to account for assume up-skilling and compositional changes in the workforce. Thus, the new entrant is more likely to hold a qualification than the worker he or she has replaced, and has the same propensity to hold a post-school qualification as is the case for employment within the occupation as a whole.

To make retirements distinct from other net outflows from an occupation, we apply projected retirement rates to all five year age cohorts from age 50 and above. Estimated retirements in any five year age cohort are then compared against national averages to

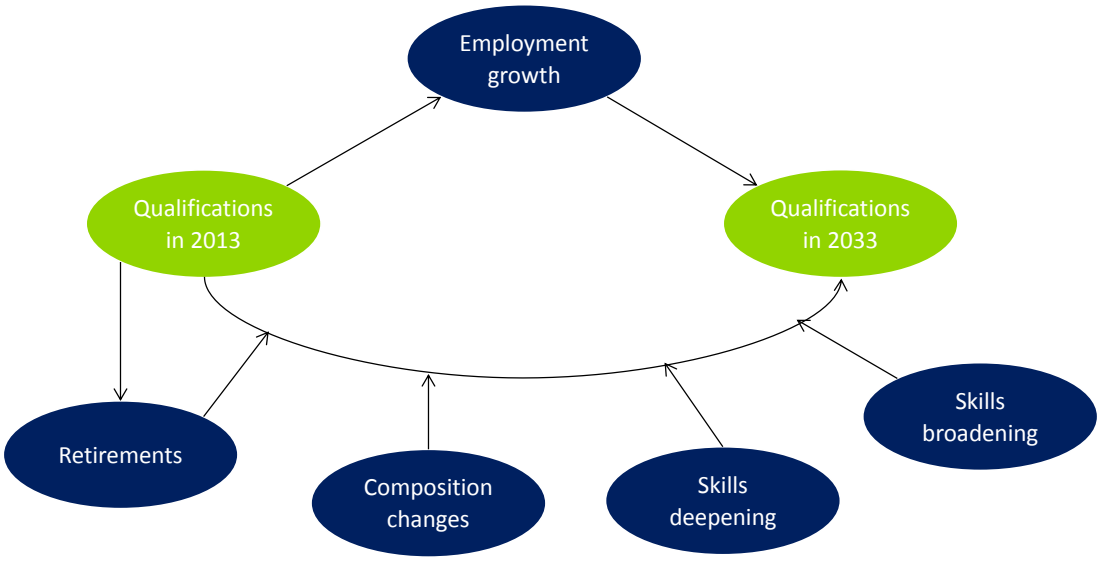
ensure that estimated retirement rates across all occupations are also consistent with economy wide labour force measures

Estimated retirements for each occupation thus reflect the workers that are likely to never return to their original occupation and therefore generate the need for additional long term training demand.

Drivers of qualification demand

Figure G.1 provides a graphical depiction of the drivers of qualification demand described above, showing how the number of qualifications held in 2013 is reconciled with the number of qualifications projected to be held in 2033.

Figure G.1: Drivers of additional qualification demands



Source: Deloitte Access Economics

Appendix H: Detailed employment forecasts

Table H.1: Detailed employment by occupation projections

Employed Total at 30 June, by 4 digit ANZSCO	2013	2023	2033	Average growth (2013-2033)
Illawarra	**130520**	**138301**	**143040**	**0.5%**
Managers	*15504*	*19114*	*22528*	*1.9%*
Chief Executives and Managing Directors	671	966	1188	2.9%
General Managers	570	815	1063	3.2%
Legislators	17	9	12	-1.7%
Aquaculture Farmers	3	3	3	0.0%
Crop Farmers	85	74	68	-1.1%
Livestock Farmers	279	188	149	-3.1%
Mixed Crop and Livestock Farmers	44	26	18	-4.4%
Advertising and Sales Managers	1395	1681	1878	1.5%
Corporate Services Managers	67	90	121	3.0%
Finance Managers	483	655	740	2.2%
Human Resource Managers	629	954	1246	3.5%
Policy and Planning Managers	237	277	321	1.5%
Research and Development Managers	152	174	202	1.4%
Construction Managers	760	1056	1133	2.0%
Engineering Managers	232	295	389	2.6%
Importers, Exporters and Wholesalers	115	130	143	1.1%
Manufacturers	183	235	215	0.8%
Production Managers	823	883	963	0.8%
Supply and Distribution Managers	471	514	644	1.6%
Child Care Centre Managers	179	181	238	1.4%
Health and Welfare Services Managers	343	571	939	5.2%
School Principals	302	311	348	0.7%
Other Education Managers	304	286	372	1.0%
ICT Managers	473	602	791	2.6%
Commissioned Officers (Management)	41	37	50	1.0%
Senior Non-commissioned Defence Force Members	0	0	0	
Other Specialist Managers	466	614	757	2.5%
Cafe and Restaurant Managers	825	1023	1170	1.8%
Caravan Park and Camping Ground Managers	42	50	72	2.7%
Hotel and Motel Managers	272	333	389	1.8%
Licensed Club Managers	195	175	183	-0.3%
Other Accommodation and Hospitality Managers	131	110	129	-0.1%
Retail Managers	3096	3594	3854	1.1%
Amusement, Fitness and Sports Centre Managers	88	120	153	2.8%

Call or Contact Centre and Customer Service Managers	475	746	978	3.7%
Conference and Event Organisers	338	426	555	2.5%
Transport Services Managers	136	162	168	1.1%
Other Hospitality, Retail and Service Managers	582	748	886	2.1%
Professionals	*27738*	*33001*	*36557*	*1.4%*
Actors, Dancers and Other Entertainers	53	64	72	1.5%
Music Professionals	100	141	156	2.2%
Photographers	56	73	91	2.5%
Visual Arts and Crafts Professionals	97	76	68	-1.8%
Artistic Directors, and Media Producers and Presenters	126	127	130	0.2%
Authors, and Book and Script Editors	41	53	54	1.4%
Film, Television, Radio and Stage Directors	89	121	129	1.9%
Journalists and Other Writers	214	249	251	0.8%
Accountants	1395	1488	1563	0.6%
Auditors, Company Secretaries and Corporate Treasurers	164	198	220	1.5%
Financial Brokers	171	217	250	1.9%
Financial Dealers	137	148	150	0.5%
Financial Investment Advisers and Managers	387	410	463	0.9%
Human Resource Professionals	580	665	705	1.0%
ICT Trainers	22	35	35	2.3%
Training and Development Professionals	313	349	381	1.0%
Actuaries, Mathematicians and Statisticians	66	73	84	1.2%
Archivists, Curators and Records Managers	71	116	148	3.7%
Economists	24	55	64	5.0%
Intelligence and Policy Analysts	131	159	198	2.1%
Land Economists and Valuers	149	130	147	-0.1%
Librarians	210	221	232	0.5%
Management and Organisation Analysts	471	550	619	1.4%
Other Information and Organisation Professionals	211	273	339	2.4%
Advertising and Marketing Professionals	367	411	437	0.9%
ICT Sales Professionals	104	89	98	-0.3%
Public Relations Professionals	202	240	257	1.2%
Technical Sales Representatives	408	383	400	-0.1%
Air Transport Professionals	222	245	283	1.2%
Marine Transport Professionals	129	178	216	2.6%
Architects and Landscape Architects	124	133	150	1.0%
Cartographers and Surveyors	204	232	263	1.3%
Fashion, Industrial and Jewellery Designers	72	65	61	-0.8%
Graphic and Web Designers, and Illustrators	422	496	562	1.4%
Interior Designers	69	76	82	0.9%
Urban and Regional Planners	111	121	134	0.9%
Chemical and Materials Engineers	182	158	167	-0.4%
Civil Engineering Professionals	556	618	687	1.1%
Electrical Engineers	429	451	472	0.5%
Electronics Engineers	48	44	47	-0.1%
Industrial, Mechanical and Production Engineers	501	544	584	0.8%
Mining Engineers	181	180	253	1.7%
Other Engineering Professionals	101	115	123	1.0%
Agricultural and Forestry Scientists	23	26	31	1.5%
Chemists, and Food and Wine Scientists	106	98	102	-0.2%
Environmental Scientists	171	193	226	1.4%
Geologists and Geophysicists	66	94	132	3.5%

Life Scientists	75	101	116	2.2%
Medical Laboratory Scientists	228	240	264	0.7%
Veterinarians	55	60	66	0.9%
Other Natural and Physical Science Professionals	74	140	145	3.4%
Early Childhood (Pre-primary School) Teachers	375	527	727	3.4%
Primary School Teachers	2298	2546	2637	0.7%
Middle School Teachers	5	17	19	6.9%
Secondary School Teachers	2433	2736	2837	0.8%
Special Education Teachers	404	411	455	0.6%
University Lecturers and Tutors	860	1381	1509	2.9%
Vocational Education Teachers	753	831	931	1.1%
Education Advisers and Reviewers	130	165	176	1.5%
Private Tutors and Teachers	413	608	723	2.8%
Teachers of English to Speakers of Other Languages	86	86	97	0.6%
Dietitians	156	177	210	1.5%
Medical Imaging Professionals	165	214	227	1.6%
Occupational and Environmental Health Professionals	269	421	546	3.6%
Optometrists and Orthoptists	24	51	54	4.1%
Pharmacists	178	218	222	1.1%
Other Health Diagnostic and Promotion Professionals	83	121	125	2.1%
Chiropractors and Osteopaths	34	62	78	4.2%
Complementary Health Therapists	57	75	76	1.4%
Dental Practitioners	123	111	130	0.3%
Occupational Therapists	192	248	330	2.7%
Physiotherapists	184	300	342	3.1%
Podiatrists	54	54	60	0.5%
Speech Professionals and Audiologists	123	126	146	0.9%
Generalist Medical Practitioners	540	759	893	2.5%
Anaesthetists	29	47	50	2.8%
Internal Medicine Specialists	66	77	80	1.0%
Psychiatrists	26	42	45	2.8%
Surgeons	33	45	50	2.1%
Other Medical Practitioners	122	147	161	1.4%
Midwives	124	181	193	2.2%
Nurse Educators and Researchers	73	55	55	-1.4%
Nurse Managers	178	211	274	2.2%
Registered Nurses	2679	3140	3362	1.1%
ICT Business and Systems Analysts	269	300	326	1.0%
Multimedia Specialists and Web Developers	106	133	180	2.7%
Software and Applications Programmers	816	974	1080	1.4%
Database and Systems Administrators, and ICT Security Specialists	362	441	482	1.4%
Computer Network Professionals	243	304	324	1.4%
ICT Support and Test Engineers	88	142	194	4.0%
Telecommunications Engineering Professionals	67	96	96	1.8%
Barristers	59	57	65	0.5%
Judicial and Other Legal Professionals	73	91	101	1.6%
Solicitors	461	614	691	2.0%
Counsellors	245	308	360	1.9%
Ministers of Religion	138	210	207	2.0%
Psychologists	346	458	560	2.4%
Social Professionals	139	210	233	2.6%

Social Workers	296	427	534	3.0%
Welfare, Recreation and Community Arts Workers	253	324	397	2.3%
Technicians and Trades Workers	*19543*	*18420*	*16564*	*-0.8%*
Agricultural Technicians	14	8	8	-2.8%
Medical Technicians	333	429	441	1.4%
Primary Products Inspectors	37	54	52	1.7%
Science Technicians	111	104	92	-0.9%
Architectural, Building and Surveying Technicians	520	504	447	-0.8%
Civil Engineering Draftspersons and Technicians	125	123	118	-0.3%
Electrical Engineering Draftspersons and Technicians	81	78	61	-1.4%
Electronic Engineering Draftspersons and Technicians	53	44	37	-1.8%
Mechanical Engineering Draftspersons and Technicians	62	55	48	-1.3%
Safety Inspectors	96	85	75	-1.2%
Other Building and Engineering Technicians	340	558	731	3.9%
ICT Support Technicians	522	587	599	0.7%
Telecommunications Technical Specialists	24	18	16	-2.0%
Automotive Electricians	77	89	77	0.0%
Motor Mechanics	1193	1019	868	-1.6%
Metal Casting, Forging and Finishing Trades Workers	9	7	4	-4.0%
Sheetmetal Trades Workers	149	166	135	-0.5%
Structural Steel and Welding Trades Workers	1250	1120	927	-1.5%
Aircraft Maintenance Engineers	107	78	63	-2.6%
Metal Fitters and Machinists	2165	1912	1638	-1.4%
Precision Metal Trades Workers	77	99	87	0.6%
Toolmakers and Engineering Patternmakers	62	43	32	-3.3%
Panelbeaters	197	179	149	-1.4%
Vehicle Body Builders and Trimmers	44	56	50	0.6%
Vehicle Painters	124	120	105	-0.8%
Bricklayers and Stonemasons	528	505	441	-0.9%
Carpenters and Joiners	1442	1321	1145	-1.1%
Floor Finishers	160	124	107	-2.0%
Painting Trades Workers	410	379	333	-1.0%
Glaziers	94	75	61	-2.1%
Plasterers	239	243	203	-0.8%
Roof Tilers	47	89	79	2.6%
Wall and Floor Tilers	165	134	113	-1.9%
Plumbers	933	930	857	-0.4%
Electricians	1911	1740	1494	-1.2%
Airconditioning and Refrigeration Mechanics	207	303	271	1.4%
Electrical Distribution Trades Workers	228	161	140	-2.4%
Electronics Trades Workers	295	226	185	-2.3%
Telecommunications Trades Workers	159	124	101	-2.2%
Bakers and Pastrycooks	251	193	158	-2.3%
Butchers and Smallgoods Makers	319	252	228	-1.7%
Chefs	764	838	838	0.5%
Cooks	381	391	378	0.0%
Animal Attendants and Trainers	143	127	136	-0.3%
Shearers	5	1	1	-7.7%
Veterinary Nurses	63	77	76	0.9%
Florists	49	63	59	0.9%
Gardeners	641	580	543	-0.8%
Greenkeepers	199	151	138	-1.8%

Nurserypersons	32	26	25	-1.2%
Hairdressers	956	891	813	-0.8%
Binders, Finishers and Screen Printers	25	22	15	-2.5%
Graphic Pre-press Trades Workers	31	17	13	-4.3%
Printers	108	77	56	-3.2%
Canvas and Leather Goods Makers	21	23	17	-1.1%
Clothing Trades Workers	57	56	49	-0.8%
Upholsterers	22	16	11	-3.4%
Cabinetmakers	165	110	76	-3.8%
Wood Machinists and Other Wood Trades Workers	37	20	13	-5.1%
Boat Builders and Shipwrights	54	46	40	-1.5%
Chemical, Gas, Petroleum and Power Generation Plant Operators	138	128	111	-1.1%
Gallery, Library and Museum Technicians	82	87	80	-0.1%
Jewellers	64	47	36	-2.8%
Performing Arts Technicians	95	90	81	-0.8%
Signwriters	73	58	52	-1.7%
Other Miscellaneous Technicians and Trades Workers	178	144	131	-1.5%
Community and Personal Service Workers	*13755*	*16192*	*19089*	*1.7%*
Ambulance Officers and Paramedics	317	442	561	2.9%
Dental Hygienists, Technicians and Therapists	73	84	103	1.7%
Diversional Therapists	80	106	120	2.0%
Enrolled and Mothercraft Nurses	254	278	279	0.5%
Indigenous Health Workers	21	29	37	2.9%
Massage Therapists	174	226	305	2.8%
Welfare Support Workers	666	808	928	1.7%
Child Carers	1281	1565	1918	2.0%
Education Aides	791	978	1113	1.7%
Aged and Disabled Carers	1307	1670	2013	2.2%
Dental Assistants	244	275	330	1.5%
Nursing Support and Personal Care Workers	1149	1366	1534	1.5%
Special Care Workers	30	50	62	3.7%
Bar Attendants and Baristas	1529	1634	1835	0.9%
Cafe Workers	266	362	433	2.5%
Gaming Workers	82	58	65	-1.2%
Hotel Service Managers	66	52	52	-1.2%
Waiters	1122	1262	1387	1.1%
Other Hospitality Workers	37	44	42	0.6%
Defence Force Members - Other Ranks	0	0	0	
Fire and Emergency Workers	247	272	308	1.1%
Police	981	1081	1291	1.4%
Prison Officers	183	174	209	0.7%
Security Officers and Guards	701	844	970	1.6%
Beauty Therapists	396	455	536	1.5%
Driving Instructors	83	82	105	1.2%
Funeral Workers	65	79	94	1.9%
Gallery, Museum and Tour Guides	38	47	45	0.8%
Personal Care Consultants	55	46	55	0.0%
Tourism and Travel Advisers	185	235	274	2.0%
Travel Attendants	144	114	118	-1.0%
Other Personal Service Workers	175	206	269	2.2%
Fitness Instructors	283	329	477	2.6%

Outdoor Adventure Guides	37	36	40	0.4%
Sports Coaches, Instructors and Officials	534	748	995	3.2%
Sportspersons	159	155	186	0.8%
Clerical and Administrative Workers	*18376*	*17098*	*15076*	*-1.0%*
Contract, Program and Project Administrators	1196	1395	1482	1.1%
Office Managers	1358	1298	1136	-0.9%
Practice Managers	171	229	276	2.4%
Personal Assistants	558	463	359	-2.2%
Secretaries	765	576	405	-3.1%
General Clerks	2585	2833	2952	0.7%
Keyboard Operators	637	469	338	-3.1%
Call or Contact Centre Workers	544	533	424	-1.2%
Inquiry Clerks	754	619	505	-2.0%
Receptionists	2038	1811	1479	-1.6%
Accounting Clerks	1430	1165	938	-2.1%
Bookkeepers	868	824	648	-1.5%
Payroll Clerks	554	512	463	-0.9%
Bank Workers	405	323	295	-1.6%
Credit and Loans Officers	174	174	157	-0.5%
Insurance, Money Market and Statistical Clerks	496	382	342	-1.8%
Betting Clerks	27	9	5	-8.1%
Couriers and Postal Deliverers	653	566	494	-1.4%
Filing and Registry Clerks	204	179	137	-2.0%
Mail Sorters	243	200	141	-2.7%
Survey Interviewers	19	27	29	2.1%
Switchboard Operators	23	13	12	-3.2%
Other Clerical and Office Support Workers	59	46	40	-1.9%
Purchasing and Supply Logistics Clerks	939	868	685	-1.6%
Transport and Despatch Clerks	495	420	350	-1.7%
Conveyancers and Legal Executives	90	81	69	-1.3%
Court and Legal Clerks	118	104	86	-1.6%
Debt Collectors	99	78	56	-2.8%
Human Resource Clerks	129	122	99	-1.3%
Inspectors and Regulatory Officers	457	517	450	-0.1%
Insurance Investigators, Loss Adjusters and Risk Surveyors	48	36	33	-1.9%
Library Assistants	72	82	70	-0.1%
Other Miscellaneous Clerical and Administrative Workers	168	144	121	-1.6%
Sales Workers	*13001*	*12656*	*12210*	*-0.3%*
Auctioneers, and Stock and Station Agents	20	20	19	-0.3%
Insurance Agents	84	95	103	1.0%
Sales Representatives	898	818	724	-1.1%
Real Estate Sales Agents	993	858	852	-0.8%
Sales Assistants (General)	6799	6872	6595	-0.2%
ICT Sales Assistants	174	156	151	-0.7%
Motor Vehicle and Vehicle Parts Salespersons	404	383	367	-0.5%
Pharmacy Sales Assistants	583	520	499	-0.8%
Retail Supervisors	512	470	498	-0.1%
Service Station Attendants	92	115	110	0.9%
Street Vendors and Related Salespersons	82	92	88	0.4%
Other Sales Assistants and Salespersons	249	310	343	1.6%
Checkout Operators and Office Cashiers	1582	1449	1387	-0.7%
Models and Sales Demonstrators	93	83	81	-0.7%

Retail and Wool Buyers	53	53	48	-0.5%
Telemarketers	135	151	144	0.3%
Ticket Salespersons	170	141	137	-1.1%
Visual Merchandisers	51	47	41	-1.1%
Other Sales Support Workers	27	23	23	-0.8%
Machinery Operators And Drivers	*10645*	*10329*	*10240*	*-0.2%*
Clay, Concrete, Glass and Stone Processing Machine Operators	72	32	24	-5.3%
Industrial Spraypainters	110	123	105	-0.2%
Paper and Wood Processing Machine Operators	75	56	48	-2.2%
Photographic Developers and Printers	11	4	4	-4.9%
Plastics and Rubber Production Machine Operators	80	61	47	-2.6%
Sewing Machinists	117	80	60	-3.3%
Textile and Footwear Production Machine Operators	13	9	5	-4.7%
Other Machine Operators	170	156	143	-0.9%
Crane, Hoist and Lift Operators	374	351	330	-0.6%
Drillers, Miners and Shot Firers	1482	1747	2137	1.8%
Engineering Production Systems Workers	925	804	689	-1.5%
Other Stationary Plant Operators	380	373	346	-0.5%
Agricultural, Forestry and Horticultural Plant Operators	62	62	62	0.0%
Earthmoving Plant Operators	529	523	538	0.1%
Forklift Drivers	423	487	487	0.7%
Other Mobile Plant Operators	170	149	149	-0.7%
Automobile Drivers	489	479	472	-0.2%
Bus and Coach Drivers	642	542	529	-1.0%
Train and Tram Drivers	361	349	331	-0.4%
Delivery Drivers	726	670	622	-0.8%
Truck Drivers	2370	2295	2159	-0.5%
Storepersons	1064	977	953	-0.5%
Labourers	*11958*	*11491*	*10776*	*-0.5%*
Car Detailers	275	186	165	-2.5%
Commercial Cleaners	1827	1806	1663	-0.5%
Domestic Cleaners	291	271	267	-0.4%
Housekeepers	213	248	254	0.9%
Laundry Workers	223	244	224	0.0%
Other Cleaners	129	120	118	-0.4%
Building and Plumbing Labourers	633	580	514	-1.0%
Concreters	438	406	379	-0.7%
Fencers	136	131	116	-0.8%
Insulation and Home Improvement Installers	122	101	83	-1.9%
Paving and Surfacing Labourers	197	128	117	-2.6%
Railway Track Workers	114	86	70	-2.4%
Structural Steel Construction Workers	382	355	361	-0.3%
Other Construction and Mining Labourers	79	104	99	1.1%
Food and Drink Factory Workers	128	95	79	-2.4%
Meat Boners and Slicers, and Slaughterers	20	13	10	-3.4%
Meat, Poultry and Seafood Process Workers	53	31	25	-3.7%
Packers	347	303	263	-1.4%
Product Assemblers	258	155	116	-3.9%
Metal Engineering Process Workers	444	432	376	-0.8%
Plastics and Rubber Factory Workers	14	9	6	-4.1%
Product Quality Controllers	85	91	75	-0.6%

Timber and Wood Process Workers	64	39	28	-4.0%
Other Factory Process Workers	108	101	93	-0.7%
Aquaculture Workers	2	1	1	-3.4%
Crop Farm Workers	39	30	20	-3.3%
Forestry and Logging Workers	4	6	5	1.1%
Garden and Nursery Labourers	289	300	275	-0.2%
Livestock Farm Workers	120	105	82	-1.9%
Mixed Crop and Livestock Farm Workers	6	3	2	-5.3%
Other Farm, Forestry and Garden Workers	93	117	114	1.0%
Fast Food Cooks	536	542	580	0.4%
Food Trades Assistants	57	51	44	-1.3%
Kitchenhands	1486	1452	1408	-0.3%
Freight and Furniture Handlers	362	406	400	0.5%
Shelf Fillers	690	636	587	-0.8%
Caretakers	48	59	56	0.8%
Deck and Fishing Hands	77	113	108	1.7%
Handypersons	551	528	527	-0.2%
Motor Vehicle Parts and Accessories Fitters	162	95	81	-3.4%
Printing Assistants and Table Workers	23	14	11	-3.6%
Recycling and Rubbish Collectors	24	20	17	-1.7%
Vending Machine Attendants	46	46	45	-0.1%
Other Miscellaneous Labourers	763	932	912	0.9%

Source: Deloitte Access Economics

Table H.2: Detailed employment by industry projections

Employed Total at 30 June, by 3 digit ANZSIC	2013	2023	2033	Average growth (2013-2033
Illawarra	**130425**	**138220**	**143192**	0.5%
Agriculture, forestry and fishing	*967*	*679*	*533*	-2.9%
Nursery and Floriculture Production	69	25	20	-6.0%
Mushroom and Vegetable Growing	68	67	62	-0.5%
Fruit and Tree Nut Growing	44	38	29	-2.1%
Sheep, Beef Cattle and Grain Farming	237	141	104	-4.0%
Other Crop Growing	0	0	0	
Dairy Cattle Farming	233	151	106	-3.9%
Poultry Farming	15	12	10	-2.0%
Deer Farming	0	0	0	
Other Livestock Farming	110	61	45	-4.4%
Aquaculture	0	0	0	
Forestry and Logging	0	0	0	
Fishing	88	71	56	-2.2%
Hunting and Trapping	0	2	1	
Forestry Support Services	41	73	69	2.6%
Agriculture and Fishing Support Services	62	38	31	-3.4%

Mining	*3339*	*4308*	*4246*	1.2%
Coal Mining	2546	3172	2887	0.6%
Oil and Gas Extraction	190	322	437	4.3%
Metal Ore Mining	72	114	124	2.8%
Construction Material Mining	186	109	95	-3.3%
Other Non-Metallic Mineral Mining and Quarrying	3	2	2	-2.0%
Exploration	100	136	131	1.4%
Other Mining Support Services	242	453	570	4.4%
Manufacturing	*12267*	*10057*	*8147*	-2.0%
Meat and Meat Product Manufacturing	167	99	72	-4.1%
Seafood Processing	12	4	2	-8.6%
Dairy Product Manufacturing	78	47	37	-3.7%
Fruit and Vegetable Processing	18	15	11	-2.4%
Oil and Fat Manufacturing	6	9	9	2.0%
Grain Mill and Cereal Product Manufacturing	61	37	27	-4.0%
Bakery Product Manufacturing	654	416	308	-3.7%
Sugar and Confectionery Manufacturing	60	33	24	-4.5%
Other Food Product Manufacturing	54	36	26	-3.6%
Beverage Manufacturing	134	95	73	-3.0%
Cigarette and Tobacco Product Manufacturing	14	7	6	-4.1%
Textile Manufacturing	10	5	3	-5.8%
Leather Tanning, Fur Dressing and Leather Product Manufacturing	11	3	1	-11.3%
Textile Product Manufacturing	75	32	16	-7.4%
Knitted Product Manufacturing	1	0	0	-100.0%
Clothing and Footwear Manufacturing	202	76	39	-7.9%
Log Sawmilling and Timber Dressing	100	36	19	-8.0%
Other Wood Product Manufacturing	402	259	164	-4.4%
Pulp, Paper and Paperboard Manufacturing	36	16	8	-7.2%
Converted Paper Product Manufacturing	41	31	20	-3.5%
Printing and Printing Support Services	333	175	116	-5.1%
Reproduction of Recorded Media	1	1	1	0.0%
Petroleum and Coal Product Manufacturing	145	59	35	-6.9%
Basic Chemical Manufacturing	74	23	15	-7.7%
Basic Polymer Manufacturing	17	11	6	-5.1%
Fertiliser and Pesticide Manufacturing	16	5	3	-8.0%
Pharmaceutical and Medicinal Product Manufacturing	150	88	67	-3.9%
Cleaning Compound and Toiletry Preparation Manufacturing	95	46	30	-5.6%
Other Basic Chemical Product Manufacturing	3	4	5	2.6%
Polymer Product Manufacturing	252	102	65	-6.6%
Natural Rubber Product Manufacturing	60	23	19	-5.6%
Glass and Glass Product Manufacturing	40	35	29	-1.6%
Ceramic Product Manufacturing	282	225	182	-2.2%
Cement, Lime, Plaster and Concrete Product Manufacturing	146	133	104	-1.7%
Other Non-Metallic Mineral Product Manufacturing	86	58	53	-2.4%

Basic Ferrous Metal Manufacturing	4135	4661	4065	-0.1%
Basic Ferrous Metal Product Manufacturing	70	62	44	-2.3%
Basic Non-Ferrous Metal Manufacturing	353	736	833	4.4%
Basic Non-Ferrous Metal Product Manufacturing	287	379	298	0.2%
Iron and Steel Forging	0	0	0	
Structural Metal Product Manufacturing	291	225	155	-3.1%
Metal Container Manufacturing	70	27	13	-8.1%
Sheet Metal Product Manufacturing (except Metal Structural and Container Products)	8	4	2	-6.7%
Other Fabricated Metal Product Manufacturing	308	211	143	-3.8%
Motor Vehicle and Motor Vehicle Part Manufacturing	256	140	84	-5.4%
Other Transport Equipment Manufacturing	314	164	104	-5.4%
Professional and Scientific Equipment Manufacturing	209	99	76	-4.9%
Computer and Electronic Equipment Manufacturing	270	121	79	-6.0%
Electrical Equipment Manufacturing	249	98	61	-6.8%
Domestic Appliance Manufacturing	57	11	4	-12.4%
Pump, Compressor, Heating and Ventilation Equipment Manufacturing	47	32	24	-3.3%
Specialised Machinery and Equipment Manufacturing	805	498	375	-3.7%
Other Machinery and Equipment Manufacturing	207	119	77	-4.8%
Furniture Manufacturing	352	165	85	-6.9%
Other Manufacturing	143	61	30	-7.5%
Electricity, gas, water and waste services	*1732*	*1570*	*1409*	-1.0%
Electricity Generation	221	172	135	-2.4%
Electricity Transmission	97	40	22	-7.1%
Electricity Distribution	502	370	303	-2.5%
On Selling Electricity and Electricity Market Operation	31	22	25	-1.1%
Gas Supply	80	63	61	-1.3%
Water Supply, Sewerage and Drainage Services	332	250	187	-2.8%
Waste Collection Services	301	300	259	-0.7%
Waste Treatment, Disposal and Remediation Services	168	353	417	4.7%
Construction	*10907*	*10678*	*10121*	-0.4%
Residential Building Construction	1573	1604	1531	-0.1%
Non-Residential Building Construction	549	561	487	-0.6%
Heavy and Civil Engineering Construction	816	819	786	-0.2%
Land Development and Site Preparation Services	610	512	491	-1.1%
Building Structure Services	1222	1049	998	-1.0%
Building Installation Services	2750	2829	2687	-0.1%
Building Completion Services	2210	2263	2151	-0.1%
Other Construction Services	1177	1041	990	-0.9%
Wholesale trade	*2333*	*2507*	*2538*	0.4%
Agricultural Product Wholesaling	44	56	56	1.2%
Mineral, Metal and Chemical Wholesaling	308	355	369	0.9%
Timber and Hardware Goods Wholesaling	402	435	450	0.6%
Specialised Industrial Machinery and Equipment Wholesaling	159	177	182	0.7%

Other Machinery and Equipment Wholesaling	420	407	395	-0.3%
Motor Vehicle and Motor Vehicle Parts Wholesaling	165	183	184	0.5%
Grocery, Liquor and Tobacco Product Wholesaling	392	389	377	-0.2%
Textile, Clothing and Footwear Wholesaling	61	60	56	-0.4%
Pharmaceutical and Toiletry Goods Wholesaling	133	125	136	0.1%
Furniture, Floor Covering and Other Goods Wholesaling	220	273	273	1.1%
Commission-Based Wholesaling	29	47	60	3.7%
Retail trade	*16677*	*16240*	*16502*	-0.1%
Motor Vehicle Retailing	851	856	864	0.1%
Motor Vehicle Parts and Tyre Retailing	386	369	358	-0.4%
Fuel Retailing	470	328	287	-2.4%
Supermarket and Grocery Stores	3660	3461	3547	-0.2%
Specialised Food Retailing	1738	1786	1842	0.3%
Furniture, Floor Coverings, Houseware and Textile Goods Retailing	583	644	650	0.5%
Electrical and Electronic Goods Retailing	932	918	872	-0.3%
Hardware, Building and Garden Supplies Retailing	985	1065	1129	0.7%
Recreational Goods Retailing	963	928	887	-0.4%
Clothing, Footwear and Personal Accessory Retailing	2180	2315	2467	0.6%
Department Stores	1450	1071	948	-2.1%
Pharmaceutical and Other Store-Based Retailing	2318	2197	2243	-0.2%
Non-Store Retailing	157	293	394	4.7%
Retail Commission-Based Buying and/or Selling	4	9	14	6.5%
Accommodation and food services	*9790*	*10382*	*11141*	0.6%
Accommodation	956	906	965	0.0%
Cafes, Restaurants and Takeaway Food Services	6442	7068	7794	1.0%
Pubs, Taverns and Bars	936	1062	1135	1.0%
Clubs (Hospitality)	1456	1346	1247	-0.8%
Transport, postal and warehousing	*10272*	*11455*	*12108*	0.8%
Road Freight Transport	2653	2752	2880	0.4%
Road Passenger Transport	1177	1217	1241	0.3%
Rail Freight Transport	398	488	520	1.3%
Rail Passenger Transport	1306	1190	1110	-0.8%
Water Freight Transport	120	193	223	3.1%
Water Passenger Transport	23	27	28	1.0%
Air and Space Transport	918	882	919	0.0%
Scenic and Sightseeing Transport	51	50	43	-0.8%
Pipeline and Other Transport	69	127	146	3.8%
Postal and Courier Pick-up and Delivery Services	1503	1539	1372	-0.5%
Water Transport Support Services	1113	1791	2203	3.5%
Airport Operations and Other Air Transport Support Services	82	142	224	5.2%
Other Transport Support Services	542	670	729	1.5%
Warehousing and Storage Services	317	387	470	2.0%
Information media and telecommunications	*1788*	*1926*	*1888*	0.3%
Newspaper, Periodical, Book and Directory Publishing	322	302	270	-0.9%

Software Publishing	0	0	0	
Motion Picture and Video Activities	213	239	236	0.5%
Sound Recording and Music Publishing	23	39	42	3.1%
Radio Broadcasting	71	78	79	0.5%
Television Broadcasting	286	305	295	0.2%
Internet Publishing and Broadcasting	1	2	5	8.4%
Telecommunications Services	677	661	642	-0.3%
Internet Service Providers and Web Search Portals	52	51	47	-0.5%
Data Processing, Web Hosting and Electronic Information Storage Services	21	45	42	3.5%
Libraries and Archives	108	158	173	2.4%
Other Information Services	14	46	57	7.3%
Financial and insurance services	*3208*	*3677*	*4721*	2.0%
Central Banking	17	19	19	0.6%
Depository Financial Intermediation	1343	1486	1888	1.7%
Non-Depository Financing	11	13	14	1.2%
Financial Asset Investing	51	54	64	1.1%
Life Insurance	3	3	3	0.0%
Health and General Insurance	733	806	1019	1.7%
Superannuation Funds	455	644	945	3.7%
Auxiliary Finance and Investment Services	469	490	567	1.0%
Auxiliary Insurance Services	126	162	202	2.4%
Rental, hiring and real estate services	*2518*	*2546*	*2574*	0.1%
Motor Vehicle and Transport Equipment Rental and Hiring	81	77	77	-0.3%
Farm Animal and Bloodstock Leasing	0	0	0	
Other Goods and Equipment Rental and Hiring	380	434	415	0.4%
Non-Financial Intangible Assets (except Copyrights) Leasing	0	0	0	
Property Operators	452	395	395	-0.7%
Real Estate Services	1605	1640	1687	0.2%
Professional, scientific and technical services	*5261*	*6631*	*7860*	2.0%
Scientific Research Services	301	405	483	2.4%
Architectural, Engineering and Technical Services	1505	1874	2237	2.0%
Legal and Accounting Services	1344	1716	2055	2.1%
Advertising Services	128	173	205	2.4%
Market Research and Statistical Services	223	236	234	0.2%
Management and Related Consulting Services	493	653	795	2.4%
Veterinary Services	119	187	199	2.6%
Other Professional, Scientific and Technical Services	106	171	203	3.3%
Computer System Design and Related Services	1042	1216	1449	1.7%
Administrative and support services	*2789*	*3514*	*3613*	1.3%
Employment Services	620	753	733	0.8%
Travel Agency and Tour Arrangement Services	236	262	273	0.7%
Other Administrative Services	390	488	507	1.3%
Building Cleaning, Pest Control and Gardening Services	1507	1960	2042	1.5%
Packaging Services	36	51	58	2.4%

Public administration and safety	*8598*	*8501*	*9486*	0.5%
Central Government Administration	1540	1296	1254	-1.0%
State Government Administration	2049	2261	2721	1.4%
Local Government Administration	1721	1777	1989	0.7%
Justice	146	172	184	1.2%
Government Representation	3	1	1	-5.3%
Defence	115	145	162	1.7%
Public Order and Safety Services	3004	2836	3161	0.3%
Regulatory Services	20	13	14	-1.8%
Education and training	*13182*	*14805*	*16114*	1.0%
Preschool Education	488	537	607	1.1%
School Education	6469	6882	7006	0.4%
Tertiary Education	4623	5180	5697	1.0%
Adult, Community and Other Education	1602	2197	2797	2.8%
Educational Support Services	0	9	7	
Health care and social assistance	*15806*	*19416*	*20794*	1.4%
Hospitals	3815	5004	4868	1.2%
Medical Services	1824	2140	2357	1.3%
Pathology and Diagnostic Imaging Services	636	794	888	1.7%
Allied Health Services	1984	2299	2629	1.4%
Other Health Care Services	471	595	649	1.6%
Residential Care Services	2830	3423	3636	1.3%
Child Care Services	1416	1810	2121	2.0%
Other Social Assistance Services	2830	3351	3646	1.3%
Arts and recreation services	*1716*	*1864*	*2036*	0.9%
Museum Operation	32	31	31	-0.2%
Parks and Gardens Operations	140	160	159	0.6%
Creative and Performing Arts Activities	286	319	331	0.7%
Sports and Physical Recreation Activities	978	1129	1318	1.5%
Horse and Dog Racing Activities	38	62	61	2.4%
Amusement and Other Recreation Activities	101	61	47	-3.8%
Gambling Activities	141	102	89	-2.3%
Other services	*7275*	*7464*	*7361*	0.1%
Automotive Repair and Maintenance	2108	1958	1842	-0.7%
Machinery and Equipment Repair and Maintenance	1398	1585	1491	0.3%
Other Repair and Maintenance	127	134	121	-0.2%
Personal Care Services	1832	1893	1962	0.3%
Funeral, Crematorium and Cemetery Services	119	123	140	0.8%
Other Personal Services	798	776	811	0.1%
Religious Services	436	528	516	0.8%
Civic, Professional and Other Interest Group Services	414	441	454	0.5%
Private Households Employing Staff and Undifferentiated Goods and Service-Producing Activities of Households for Own Use	43	26	24	-2.9%

Source: Deloitte Access Economics

Note: Industry totals do not exactly equal occupational totals due to differences in the normalisation process and treatment of historical data.

Limitation of our work

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