RESOURCES INDUSTRY TRAINING COUNCIL

APPEA CME

Western Australian MINING Industry: WORKFORCE DEVELOPMENT PLAN

November 2010

The Resources Industry Training Council is a State Government funded, APPEA (www.appea.com.au) and CME (www.cmewa.com) joint venture initiative to represent the training and workforce development needs of the Western Australian resources (mining, gas and oil) and downstream process manufacturing industries.

RESOURCES INDUSTRY WORKFORCE DEVELOPMENT PLAN

Note and Disclaimer:

This document is a workforce development plan for the Western Australian resources sector and was developed by the Resources Industry Training Council (RITC). Its purpose is to provide the Department of Training and Workforce Development and the State Training Board with an overview of the industry with the intention of it being incorporated into a workforce development plan for the mining and quarrying industries of Western Australia.

This workforce development plan is supplied in good faith and reflects the knowledge, expertise and experience of the developer. The information provided is derived from sources believed to be reliable and accurate at the time of publication.

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Executive Summary

The Department of Training and Workforce Development commissioned the Resources Industry Training Council (RITC) to undertake research and prepare a industry workforce development plan for the Western Australian mining and quarrying industry. In early 2010 an environmental scan was undertaken which informed the development of this workforce development plan. The environmental scan is available for download from the RITC website (www.ritcwa.com.au).

With more than $88 billion worth of resource development and expansion projects either commenced or committed in Western Australia, labour and skill shortages are already being felt despite the global financial downturn. Large-scale petroleum and iron ore projects are employing significant numbers of tradespersons during the construction phase, with the most in-demand trades being the metals, engineering and electrical trades. The construction phase requires around ten times the number of employees as does the operational phase of the project. The demand for construction skills and labour is having an effect on other industries, with employees moving from other sectors into resource project construction.

The request for the development of the workforce plan was a response to the serious labour shortages experienced across all industries prior to the global economic downturn and the knowledge that a resurgence of skills and labour demands in the resources sector has begun. Labour and skills shortages threaten to constrain economic development and prevent Western Australia from reaching its full economic potential. This plan has been designed to assist the Western Australian State Government with developing training policy, establishing VET funding priorities and the development of a workforce plan for Western Australia.

Evidence gathering and research in preparation for this scan included:

- comprehensive analysis of data and reports produced by the Chamber of Minerals and Energy WA (CME), the Australian Petroleum Production and Exploration Association (APPEA), Mining Industry Skills Centres Inc., Energy Skills Queensland, the State Training Board and the WA Department of Mines and Petroleum;
- industry visits by RITC personnel, which involved face-to-face interviews with key enterprise stakeholders;
- review of published and web-based information and data;
- consultation with industry representatives from the various sectors for validation of this workforce plan;
- analysis of data supplied by the Australian Bureau of Statistics, SkillsDMC, Manufacturing Skills Australia (MSA), IBIS World, Australian Industry Group (AIG) and other similar organisations.

The shortage of labour and the need for an appropriately skilled workforce are regularly identified as key impediments to the growth of Australia's resources sector. While this is undoubtedly true, to what extent and what actions are required, is much less certain. Given the number of variables that will affect the future growth of the industry, including Australia's investment competitiveness, the economic climate and international demand for Australian resources, it is impossible to forecast the industry's skill and labour needs into the future with a high degree of accuracy. Planning for uncertainty underscores the importance of a strong partnership between the industry and government, both of whom have very significant, though different, roles to play.

Environmental Scan

The Department of Mines and Petroleum (DMP) reports that within Western Australia there are over 513 commercial mineral projects with more than 893 operating mine sites and 64 operating oil and gas fields. More than 50 different minerals are mined. The resources sector employs more than 75,615[1] persons. The primary activities of the Western Australian mining industry include:

- metal ore and coal mining,
- non-metal ore mining and quarrying,
- salt production.

The major products and services of this industry include:

Iron Ore	Nickel	Construction materials	Rare earths
Gold	Minerals Sands	Dimension stone	Silica - silica sand
Alumina	Manganese	Gypsum	Talc
Lead	Salt	Pegmatite	Tin
Silver	Diamonds	Limestone	Tantalum
Copper	Cobalt	Manganese	Lithium
Zinc	Chromite	Molybdenum	Uranium
Coal	Clays	Phosphate	Vanadium
Oil and gas			

The resources industry includes activities that extract naturally occurring minerals, crude petroleum and natural gas. The term mining is used in the very broadest sense to include underground or open-cut mining, quarrying or evaporation pans (salt), as well as beneficiation activities which may involve crushing, screening, washing and flotation and other preparation work customarily performed at the mine site, or as a part of mining activity.

The levels of commodities produced by the resources sector and the sector's profitability rely on global commodity prices and demand. If commodity prices or demand fall too low, resource operations will stop operating and go into care and maintenance until commodity prices and demand improve. This reaction to the global economy is reflected in the number of projects that were put on hold after the global economic downturn. Prior to the downturn, severe skill shortages existed in most Western Australian industries as the resource sector drew labour from all other industries. After the global economic downturn the resources sector made a significant number of employees redundant, and this had a dramatic flow-on to the supporting industries.

Despite the global economic downturn and a fall in commodity prices, Western Australia's resources industry recorded a 19% increase in sales value. Iron ore was the largest individual mineral sector, accounting for almost half of the total value of the state's mineral and petroleum sales. Other commodities to record significant growth in sales value in 2008–09 include LNG, natural gas, gold and salt. The mineral and petroleum sectors contributed 89% ($77.5 billion) to the state's exports in 2008-2009[2].

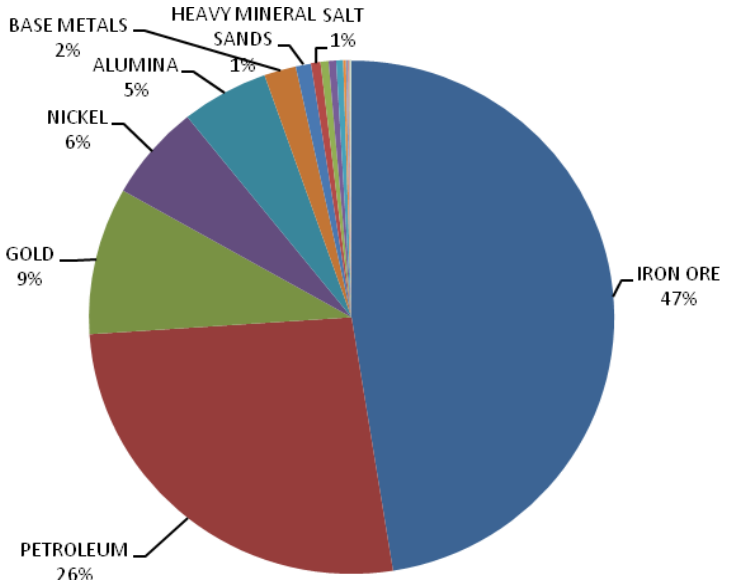
Western Australia's mineral and petroleum resources in order of value for 2009-2010[3] are:

Commodity	Value in Australian dollars
Iron ore	33,656,633,045
Petroleum	18,776,967,761
Gold	6,559,584,664
Nickel	4,280,961,827
Alumina	3,810,171,814
Base metals	1,398,610,743
Heavy mineral sands	665,316,126
Salt	417,460,428
Manganese ore	350,693,640
Coal	326,236,315
Diamonds	304,005,758
Construction materials	120,246,779
Tin-Tantalum-Lithium	74,737,442

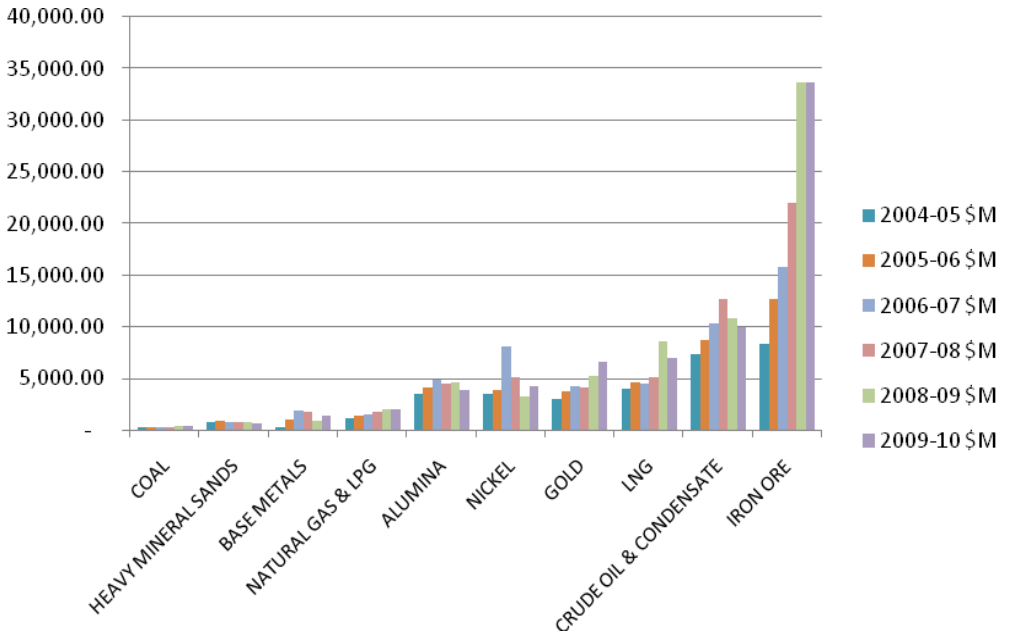
[1] Department of Mines and Petroleum: *Employment 2009;* Employment09.xls
[2] Department of Mines and Petroleum: *Mineral and Petroleum Exports by Commodity 2009-2010*; Exports0910.xls
[3] Department of Mines and Petroleum: *Quantity and Value Of Minerals And Petroleum 2009-2010*; QtyValue0910.xls

Silver	60,461,153
Limes and limestone-dolomite	28,580,812
Gypsum	17,650,877
Silica-silica sand	12,402,030
Clays	1,187,324
Gem & semi-precious stones	463,866
Dimension stone	301,508
Other	43,662,012

Commodities by Sales Value 2009-10 [4]



Trends in Dollar Sales Value of Commodities, 2004-10 [5]



Mining and onshore petroleum companies pay royalties which are a payment to the state for the right to extract minerals and petroleum. Royalties paid by petroleum projects in the Territorial Sea

[4] Department of Mines and Petroleum: http://www.dmp.wa.gov.au/documents/qtyandvalue0910.xls
[5] Department of Mines and Petroleum: http://www.dmp.wa.gov.au/documents/qtyandvalue0910.xls

subsisting permit areas, Barrow Island and the North West Shelf (where the state receives approximately 65 per cent of royalties) are shared with the Commonwealth.

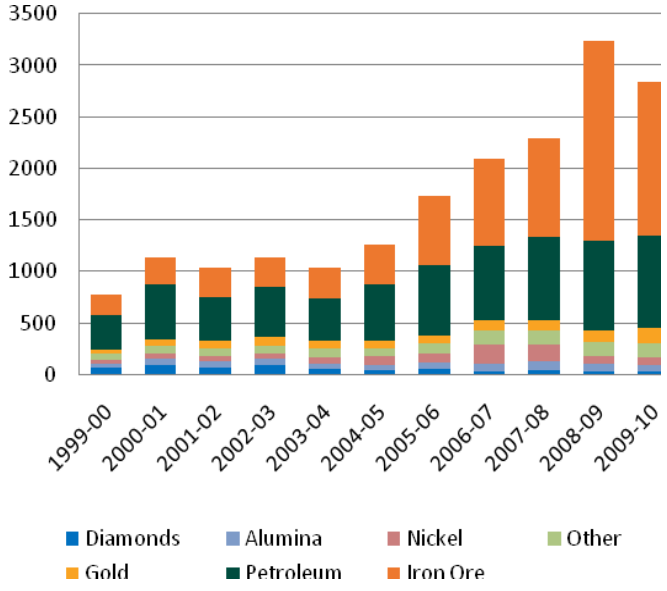
Royalties on petroleum and gas, coal and most minerals are payable on a value basis. Values are calculated as a percentage of the value of the mineral or petroleum as determined by the Minister. Different minerals and extracted products are charged different royalty rates.

Western Australian Royalty Receipts[6]

	2008-09	2009-10
Iron ore	1,946,717,875	1,495,438,193
Petroleum	868,761,581	897,025,331
Gold	116,420,727	152,528,649
Nickel	81,829,169	83,359,668
Alumina	75,982,728	61,860,134
Diamonds	18,838,566	19,192,682
Other	131,105,403	129,696,984
Total royalty receipts	3,239,656,049	2,839,101,641

Royalties received by the Western Australian government from Western Australian mineral and petroleum producers have increased from $777 million in 1999–2000 to $2.8 billion collected during the 2009-10 financial year. Royalty revenue peaked in 2008-09 at $3.2 billion[7]. '

Western Australian Royalty Receipts[8]



The industry continues to be a major employer in Western Australia, where it is estimated that one in five employees are either directly or indirectly involved in resource sector activities[9]. Data compiled by DMP show that there was an average of 75,615[10] persons employed on Western Australian mine sites during 2009. This figure does not account for head office personnel or other offsite employees and contractors that contribute to the operation of the mines. The four per cent decrease (or a loss of 9,663 jobs) that occurred as a result of the global financial downturn (June 2008) has been recovered.

The 2008 Chamber of Minerals and Energy's publication *Developing a Growth Outlook for Western Australia's Minerals and Energy Industry* predicts the demand for people, water and energy-based on proposed developments within the resources sector. According to this publication the long-term outlook for the resources sector is very positive. In summary:

- the resources industry is projected to grow significantly in the period 2008-14;
- direct labour demand is expected to peak in 2012 at ~ 38,000;

[6] Department of Mines and Petroleum: *Royalty Receipts 2009-2010*; DMP royaltyreceipts0910.xls.
[7] Department of Mines and Petroleum: *Western Australian Minerals and Petroleum Statistics Digest 2008-2009*.
[8] Department of Mines and Petroleum: *Royalty Receipts 2009-2010*; DMP royaltyreceipts0910.xls
[9] Department of Mines and Petroleum: *Western Australian Minerals and Petroleum Statistics Digest 2008-2009*.
[10] Department of Mines and Petroleum: *Employment 2009*; Employment09.xls

- the highest growth regions are expected to be the Mid-west (6,000); Goldfields/Esperance (3,000) and the Pilbara (14,000) in 2014;
- Additional employees will be fly-in fly-out (FIFO) with a peak incremental requirement of 27,000 in 2012 versus a residential workforce requirement of 11,000 in the same period.

In 2008–09, $35 billion of new capital expenditure[11] by Western Australia's mining industry represented a 25% increase compared to the previous financial year's $2.7 billion dollars. Capital expenditure by the mining industry represented 75% of Western Australia's total new capital expenditure of $30.4 billion in 2008–09. Western Australia also accounted for 64% of national investment expenditure by the mining industry in 2008–09[12].

Investment projects in the under-construction category are dominated by iron ore and LNG projects. Projects[13] include

- Woodside's Pluto Train 1 LNG project ($12 billion);
- BHP Billiton's Rapid Growth Project 5 iron ore project ($4.8 billion);
- Sino Iron's Pellet project ($5.2 billion);
- Newmont Mining Corporation's Boddington gold and copper mine ($3.7 billion); and
- Worsley Alumina's refinery expansion ($2.5 billion).

The committed investment projects category is dominated by:

- the Gorgon Joint Venture ($43 billion);
- Woodside's North Rankin redevelopment ($12 billion);
- the Oakajee Port and Rail development ($4 billion);
- Perdamen Chemicals' Coal to Urea Plant ($3.7 billion);
- Western Areas' Flying Fox, Spotted Quoll and Lounge Lizard nickel projects ($3.8 billion);
- Hamersley Iron's Brockman Syncline project ($2 billion);
- Gindalbie Metals' Karara Iron Ore project ($1.97 billion).

During the construction period the above large-scale construction projects will increase demand for metal, electrical, mechanical and other construction and commissioning tradespersons. After construction, the numbers of workers will fall dramatically as maintenance and operating staffing levels are significantly smaller and require a different skill set.

The shortage of labour and the need for an appropriately skilled workforce are regularly identified as key impediments to the growth of Australia's resources sector. While this is undoubtedly true, to what extent, and what actions are required, is much less certain. Given the number of variables that will affect the future growth of the industry, including Australia's investment competitiveness, the economic climate and international demand for Australian resources, it is impossible to forecast the industry's skill and labour needs into the future with a high degree of accuracy. Planning for uncertainty underscores the importance of a strong partnership between the industry and government, both of whom have very significant, though different, roles to play.

Industry costs generally have doubled around the world in recent years (industry costs in Australia increased more than the global average) and local factors like the increased remoteness of the fields, in deeper water, with drier gas and higher impurities, are also contributing to higher development costs. The higher the industry costs, the less competitive the industry is in the global market.

[11] ABS: *Australian Economic Indicators, Nov 2009*
[12] Department of Mines and Petroleum: *Western Australian Mineral And Petroleum Statistics Digest 2008–09*
[13] Department of Mines and Petroleum: *Prospect Magazine*

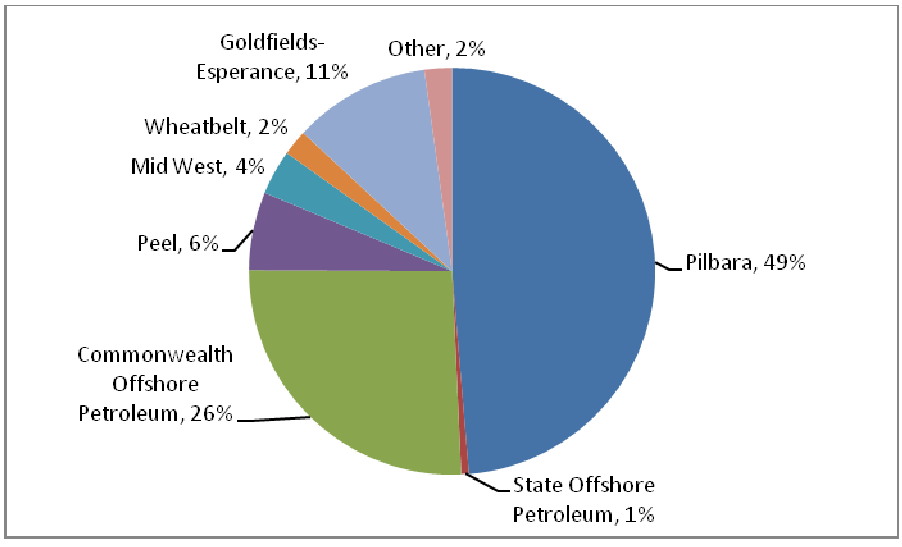
GEOGRAPHIC LOCATION OF THE INDUSTRY

The majority of the industry is conducted in remote and regional Western Australia, with most occurring in the Pilbara and the Kalgoorlie-Esperance regions, and with the Mid-west becoming a region of growth.

Large resource companies typically have a head office located in one of the large cities rather than the operations site. Head office functions typically include setting production targets, corporate standards, strategic planning and corporate compliance and reporting. Often the head office will develop and drive the graduate and leadership programs across the sites.

Sales Value of Minerals and Petroleum by Region 2009-10

Total $71 billion

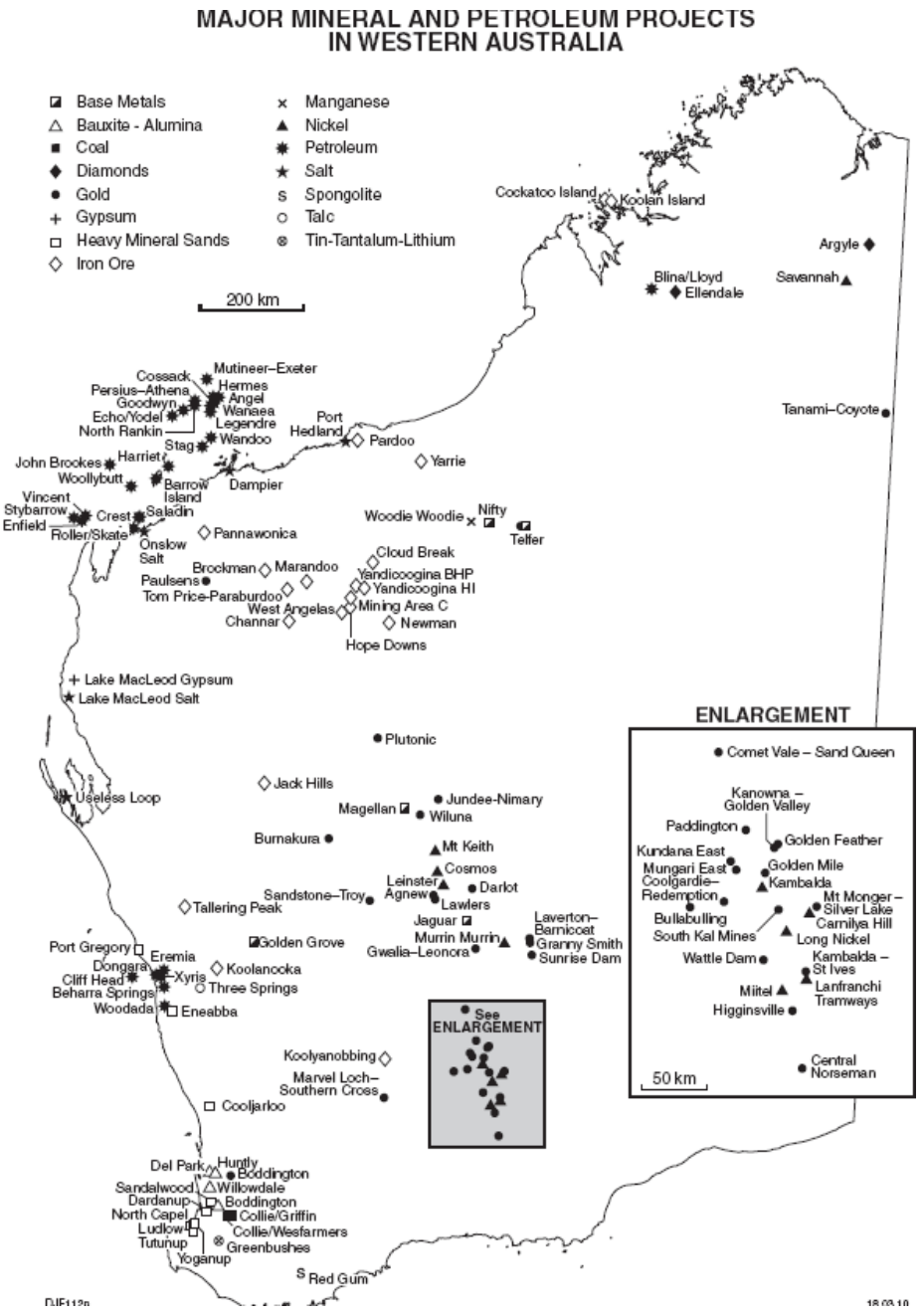


DMP data[14] shows regions in Western Australia that produce minerals and/or gas and oil. The Pilbara is the major mineral and petroleum centre for Western Australia, with 49% of the resources value being generated by minerals (mainly iron ore but including gold, manganese, copper and salt) and around 27% by petroleum. The Goldfields-Esperance region generates 11% of the State's mineral wealth mainly through gold, nickel cobalt and base metals. Currently the Mid-west generates 4% through gold, base metals and iron ore, as well as gas and oil, but this region is expected to grow with the ramping up of iron mines in the region. The Peel region generates 6% of the value through alumina and gold production. The Kimberley produces diamonds, nickel, gold and iron ore and reflects 1% of the value resources produced in Western Australia. The South-west is known for its coal mines and mineral sands.

Minerals and Petroleum Sales Value Produced by Region, 2009-10[15]

Pilbara	34,517,072,199
Commonwealth Offshore Petroleum	18,290,152,587
Goldfields-Esperance	7,722,069,088
Peel	4,424,363,331
Mid-west	2,531,835,903
Other	1,548,105,853
Wheatbelt	1,440,971,823
State Offshore Petroleum	431,765,139

[14] Department of Mines and Petroleum: http://www.dmp.wa.gov.au/documents/qtyandvalue0910.xls
[15] Department of Mines and Petroleum: http://www.dmp.wa.gov.au/documents/qtyandvalue0910.xls



Source: http://www.dmp.wa.gov.au/documents/map09.pdf

Regional Infrastructure and Availability of Adequate Local Skills and Labour

Due to a number of factors, including inadequate regional infrastructure and local skilled labour, the majority of employment in the resources sector is fly-in fly-out (FIFO). This enables employees to be sourced from across Australia, focusing on the major cities. The majority of FIFO employees are recruited from Perth.

The reliance on FIFO has:

- placed an additional burden on airports and airlines;
- increased the demand for temporary accommodation.

State-wide demand for water, electricity and gas from the minerals and energy sector is projected to grow significantly in the period 2010-14[13]. Most of this growth is expected in the Pilbara and Mid-west regions where new and expanding projects, in particular iron ore, are planned.

Anticipated[16] state-wide demand from the minerals and energy sector for water, electricity and gas includes:

[16] Chamber of Minerals and Energy: *Developing a Growth Outlook for WA's Minerals and Energy Industry, 2009*

- water demand is projected to grow at a compounded annual growth rate (CAGR) of 5.4% to 1129 gigalitres per annum (GL/a) by 2014;
- electricity demand from the Pilbara is 13766 GWh/a. This constitutes 82% of incremental growth;
- state gas is anticipated to grow at a CAGR of 6.7% to 286 PJ/a by 2014. The Pilbara region is expected to account for 82%, or 78 PJ/annum, incremental gas requirements in 2010.

Other issues related to the remote location of the resource operations include:

- lack of affordable housing;
- inadequacy of public transport;
- inadequacy of health care in respect to doctors and hospitals, including emergency, maternity, paediatrics, psychiatric and geriatric care;
- lack of 24 hours, 7 days a week childcare;
- lack of quality schools, TAFE and tertiary institutions and quality teachers;
- fuel prices average 30 cents more per litre than in the Perth area; and
- desirability of geographic areas as places to live.

EMPLOYMENT

This workforce development plan relies on data provided by the DMP which collects mining employment data from compulsory monthly accident reporting submitted by all operating mines and companies carrying out exploration on mineral and mining leases. The DMP's Resources Safety Division's AXTAT reporting system identifies the number of direct employees and contractors (including exploration personnel) working on operating mining leases. The data excludes head office and offsite employees and contractors who provide direction and support services to the mine sites.

In March 2008, legislation was introduced to capture exploration personnel working on greenfield sites. The DMP collects petroleum employment data by contacting each operating company which provides both direct and contract personnel data. Therefore little historical data is available for exploration personnel and greenfield sites.

Employment data collected and published by the Australian Bureau of Statistics (ABS) is classified using reference to the Australian and New Zealand Standard Industrial Classification (ANZSIC). This data is not directly comparable with that collected by DMP. Under ANZSIC guidelines, not all mining employment is reflected in the ABS mining industry classification. For example:

- Catering personnel working on mine sites are reflected in the Accommodation and Food Services classification, and transport personnel (truck and train drivers) working on mine sites are reflected in the Postal and Warehousing industries.
- Contractors employed in site preparation and removing overburden at a mine site on a contract or fee basis are listed under Site Preparation Services.
- Employees engaged in liquefying natural gas, the production of pig iron, hot briquetted iron, alumina, and the smelting and refining of metals, are included in Manufacturing.
- Employees providing geophysical surveying services on a contract or fee basis are included in Surveying and Mapping Services.

Construction versus Operational Workforce Needs

It is important to note that employment numbers and required skills in the resources sector differ dramatically between construction phase and operational phase. Construction typically requires large numbers of traditional tradespersons to build and install the necessary infrastructure to enable the operation to produce and process its commodity. The operational phase requires significantly fewer tradespersons (usually limited to maintenance personnel) and an introduction of extraction operators and process technicians. Construction phases normally have around ten times the number of employees as the operational phase.

Both the construction and operational phases contribute significantly to the economy. The industry has strong linkages with other sectors, so its impacts on the economy go further than the direct contribution of construction and operation. The level of additional economic activity generated by a source industry is referred to as a multiplier. There are two types of multipliers:

1. Production-induced made up of first-round effect: which is all outputs and employment required to produce the inputs for construction and operations; and an industrial support effect, which is the induced extra output and employment from all industries to support the production of the first-round effect.

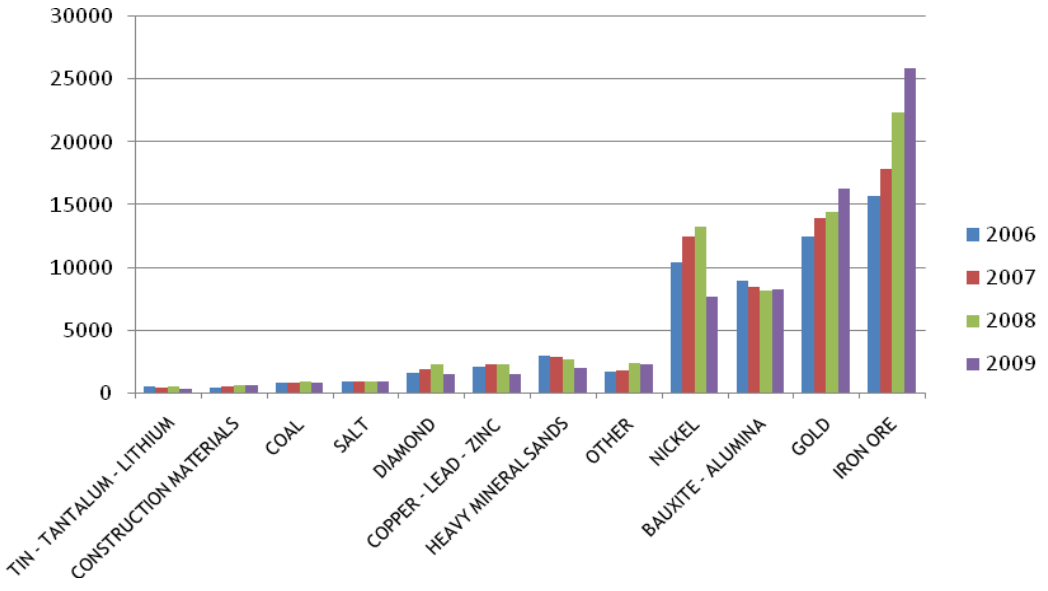
2. Consumption induced: which relates to the demand for additional goods and services due to increased spending by the wage and salary earners across all industries arising from employment.

Clements et al (2006) suggested that basic employment multipliers for construction and metals mining were 2.93 and 4.13 respectively. This means each construction position generates 1.93 jobs in a supporting industry. Therefore demand for one additional construction job requires the availability of 2.93 employees. Once the project is in operation, for each additional employee 4.13 jobs will be created in an allied industry.

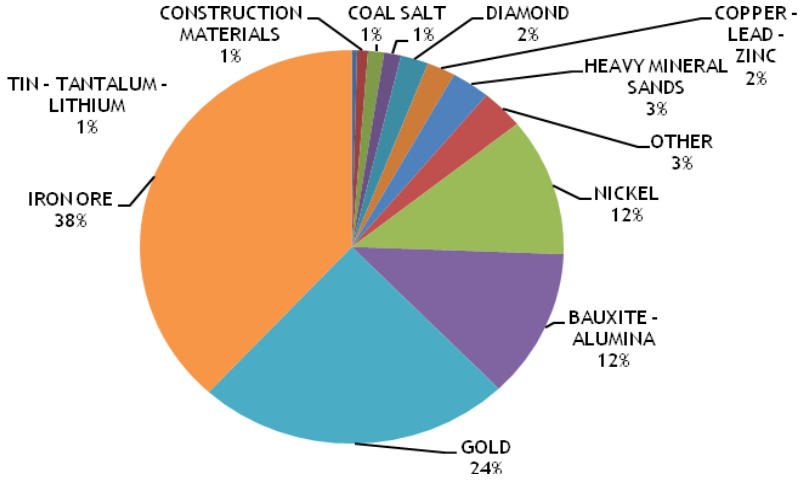
Workforce Statistics

The DMP reported both direct and contractor employment on WA mine sites averaging 67,766 in 2009[17]. Employment peaked in October 2009 at 77,528. These figures do not account for head office personnel or other offsite employees and contractors that contribute to the operation of the mine.

Trend in Average Number of Mine-site Employees and Contractors, 2006-09[18]



Employment by Commodity, 2009



Exploration employment for personnel working on greenfield sites for 2009 averaged 2,253[19].

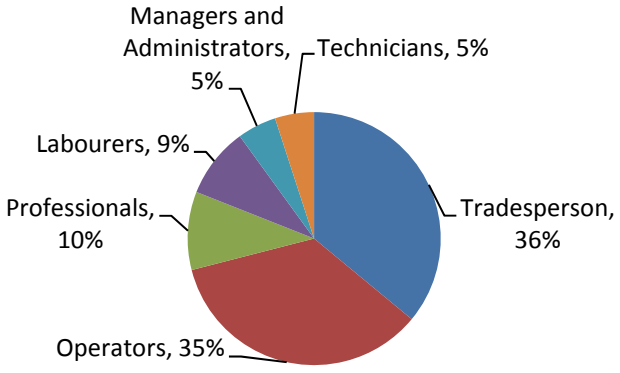
[17] Department of Mines and Petroleum: *Employment 2009*; Employment09.xls
[18] Department of Mines and Petroleum: *Employment 2009;* Employment09.xls
[19] Department of Mines and Petroleum: *Employment 2009;* Employment09.xls

Workforce Demographics

Recording workforce demographics is not as widespread in the resources sector as it is in the government sector and therefore the data provided is sourced from the ABS 6291.0.55.003 *Labour Force, Australia, Detailed*, Quarterly, Table 06: Employed persons by Industry Subdivision and Sex.

In 2008 the minerals sector workforce comprised 36% tradespersons and related workers, 35% semi-skilled workers (principally machinery operators and drivers), 10% professionals, 9% labourers, 5% technicians and 5% managers and administrators[20]. Over recent years the greatest growth has been in the technician and trades category.

Minerals Sector Workforce[21]



Women comprise around 18% of the resource sector workforce compared to a national participation rate of 46%[22]. However, women only represent three per cent of all employees at mine sites, oil rigs and minerals processing operations. Some of the reasons for the industry not being attractive to females are the requirement by many companies to work away from families for extended periods of time (FIFO) and the perception that the work is hard and dirty.

The minerals industry is the largest private sector employer of Indigenous people, with 5% of its direct workforce identifying as Indigenous. Most operations in remote and regional locations prefer local workers and are committed to increased employment of local Indigenous people who can meet their employability requirements. However, many Indigenous people located in these areas have low levels of literacy, numeracy and fitness for work attributes which precludes them from taking up training opportunities.

With regards to age, the minerals industry tends to recruit mature-age employees as there is a perception that age and safety behaviour are linked. With the exception of apprentices, employees are typically older than 18 years old. The majority of employees work full time, and their median age is 40 years, compared with a median age for all industries of 37 years. However, coal sector employees are older on average than those in the metalliferous sector.

A significant number of employees (32%) are in the 25-34 age bracket and a similar number in the 35-44 age bracket, with 21.2% of employees in the 45-54 age bracket and 11.3% in the over 55 group. With the duration of training required for an engineer being four years (after 2012 UWA engineering students will need five years), there is a need to plan ahead to cater for the 32.5% of currently employed engineers that can be expected to retire within the next ten years.

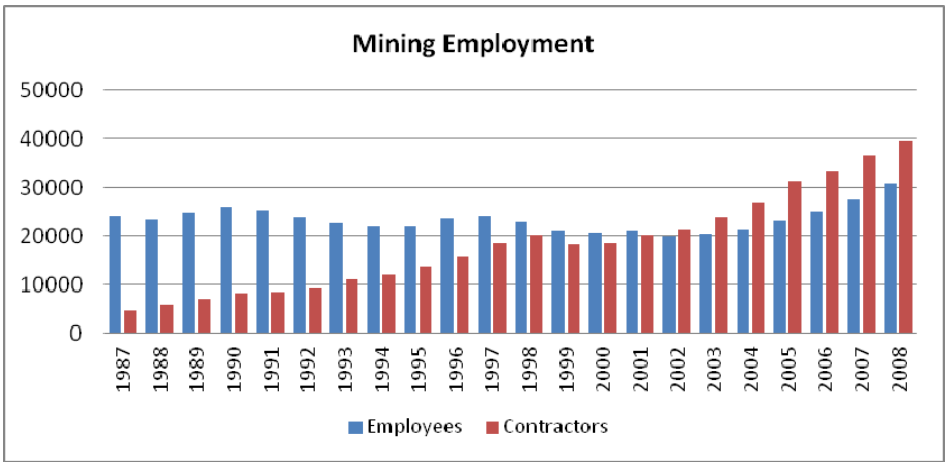
Anecdotally, employee turnover in the minerals and energy sector is high. At some FIFO sites the turnover was as high as 30% at the height of the last mining boom. The Australian Bureau of Statistics (ABS) reported that as at February 2008 12% of mining workers had changed their employer in the previous 12 months. Unfortunately, data on the amount of labour "churn", as compared to labour moving to other industries or out of the workforce, is very limited.

[20] National Institute of Labour Studies: (2008). *The Labour Force Outlook in the Australian Minerals Sector*: 2009 to 2020.
[21] ABS 6291.0.55.003 *Labour Force*, *Australia*, Detailed, Quarterly
[22] ABS (November 2009). *Labour force Australia* 6291.0.55.003.

Current Trends in Staffing Patterns

There is a distinction to be drawn between 'labour shortage', or a lack of new entry-level recruits, and a 'skills shortage' or lack of qualified trades, technicians and professional people. The resources sector has suffered from skills shortages rather than labour shortages, due to their ability to pay wages that will draw employees from other industries. On the other hand the drilling sector competes with mining, construction and defence for new entrants and therefore does experience labour shortages.

Accurate labour demand forecasts are difficult to obtain, due to a number of factors. These include the reluctance of enterprises to release commercially sensitive data and the potential for 'double counting' if there is overlap between contractors' and mining companies' data.



Short-term contracting is the norm in the construction phase of a project. Contracting is a strategy that provides workforce flexibility for projects with finite start and end dates, and different workforce needs at different stages of the construction process.

Resource-sector project construction and 'shut-down maintenance' work require particular skills and flexibility, which has resulted in experienced individuals being particularly sought by both types of service companies.

There has been an increase in the use of contractors even during operational phases, with mining services being contracted out. Following the global economic downturn, the use of contractors fell in some industry sectors. This reflects the dynamic nature of this employment method.

National Competency Standards and National Training Packages

Competency-based training has been utilised by the resources industry for many years, with many companies providing ongoing in-house training to operators and university graduates.

For many years the national competency standards have been recognised as a benchmark, and much in-house (non-nationally recognised) training is aligned to the national standards. Industry's understanding of the training package and its associated units of competency, qualification structure and assessment guidelines, continues to grow. Experience with, and the utilisation of, the VET sector and nationally recognised training is also growing.

The attainment of qualifications is not seen as a major focus for the resources industry but rather training occurs with the aim of achieving an increase in safe work practices, improvements in production rates and staff retention.

Generally the resources industry does not access public funding for training. In part this relates to:

- the perceived inflexibility of the training system;
- the industry mainly operating out of remote and regional areas;
- a large part of the resources industry is focused on skill sets as opposed to full qualifications.

This has resulted in the decision by the industry to fund its own development programs.

INDUSTRY OCCUPATIONAL OVERVIEW

The following are typical job roles found in the resources sector, and their associated qualifications.

PROFESSIONAL ROLES	Qualifications
Mining - Managers	Advanced Diploma of Metalliferous Mining Advanced Diploma of Extractive Industries Management Advanced Diploma of Surface Coal Mining Quarry Manager's Certificate Of Competency Restricted Quarry Manager's Certificate Of Competency First Class Mine Manager's Certificate Of Competency Deputy's Certificate Restricted Quarry Manager's Certificate
Engineers - Mining	Bachelor of Engineering - Mining Bachelor of Science - Extractive Metallurgy
Engineers and Scientists, General Chemical/Process Civil Electrical Environmental Geotechnical Mechanical Production Project Reliability	Bachelor of Civil Engineering Bachelor of Engineering Bachelor of Engineering – Chemical Bachelor of Engineering - Civil Bachelor of Engineering - Electrical Bachelor of Engineering – Geotechnical Bachelor of Engineering – Environmental Bachelor of Engineering - Mechanical Bachelor of Engineering - Process Bachelor of Engineering - Civil and Environmental Engineering Bachelor of Engineering - Project Engineering and Management Bachelor of Engineering - Surveying and Geoinformation Systems
Accountant/Business Analyst	Bachelor of Business (Accounting)
Archaeologist, Heritage Advisor, Anthropologist	Bachelor of Arts (Archaeology) Bachelor of Science (Archaeology) Bachelor of Arts (Anthropology)
Commercial Analysts Accountants	Bachelor of Arts/Bachelor of Business – Accounting Bachelor of Commerce – Accounting Bachelor of Commerce – Corporate Finance
Communication/Media Advisor	Bachelor of Commerce – Journalism Bachelor of Arts - Journalism
Community Liaison/Relations	
Contract Manager	Bachelor of Business, Bachelor of Commerce, Bachelor of Law
Environmentalists	Bachelor of Applied Science - Environmental Management Bachelor of Applied Science - Marine Environment Bachelor of Science/Arts, Science/Commerce, Science/Economics, Science/Education, or Science/Engineering - Environmental Science
Geologists, Geophysicists, Geostatistician	Bachelor of Applied Science - Geology Bachelor of Applied Geographical Information Systems Bachelor of Science - Geology and Geophysics Bachelor of Science -Geology and Resource Economics
Human Resources	Diploma in Human Resources Management Advanced Diploma in Management (Human Resources) Bachelor of Business - Human Resource Management Bachelor of Commerce - Human Resource Management
Hydrogeologist, Hydrologist	Bachelor of Science (Earth Science)
Information Technology Support	Certificate IV in Information Technology (Technical Support) Bachelor of Business – Information Systems/Processing
Lawyers and Contracts Management *	Bachelor of Laws

Marketing	Bachelor of Business - Marketing
Medics and Paramedics	Bachelor of Nursing Bachelor of Health Science – Paramedic
Metallurgists Metallurgical Technician#	Bachelor of Applied Science – Metallurgy
Mine Planner	
OHS Advisors and Managers	Certificate IV in Occupational Health and Safety
Project Managers	Diploma in Project Management
Public and Media Relations *	Bachelor of Business - Public Relations Bachelor of Media and Communication
Quarry Manager	Quarry Manager's Certificate examination by DMP Diploma in Mining or Engineering Associate Diploma in Surface Mining Degree or Diploma in Geology Bachelor of Engineering in Mining
Surveyors, Mine Surveyor	Bachelor of Applied Science – Surveying plus Mine Surveyor's Certificate
MAINTENANCE ROLES	
Maintenance Planner, Maintenance Scheduler	
Maintenance Technicians, Mechanical Trades, Fixed Plant Maintainers	Certificate III in Engineering – Mechanical (Maintenance Diesel Fitting)
Metal Trades	Certificate III in Engineering – Metals
Electrical and Instrumentation Trades	Certificate III in Instrumentation and Control Certificate III in Engineering – Electrical/Electronic Trade Diploma of Engineering – Advanced Trade (Mechanical and Electrical) Certificate III in Electrotechnology Electrician Certificate III in Instrumentation and Control Certificate IV in Electrical Instrumentation
OPERATOR/TECHNICIAN ROLES	
Blast Control/Firing Crew	Shot-firing Licence
Process Operators#	Certificate II, III and IV in Resource Processing Diploma of Minerals Processing Certificate III and IV in Manufactured Mineral Products
Truck Drivers#	HC and/or MC class licences
Underground Supervisor #	Underground Supervisor's Certificate examination by DMP OR Degree, Diploma or Associate Diploma in Mining Engineering
Miners – Open Cut or Surface Mining#	Certificate II in Surface Extraction Operations Certificate III in Surface Extraction Operations Certificate IV in Surface Extraction Operations Diploma of Surface Operations Management
Miners – Underground Mining#	Certificate II in Underground Metalliferous Mining Certificate III in Underground Metalliferous Mining Certificate IV in Metalliferous Mining Operations (Underground) Diploma of Underground Metalliferous Mining Management
Miners – Coal Mining#	Certificate III in Surface Extraction Operations Certificate IV in Surface Extraction Operations Diploma of Surface Operations Management Certificate IV in Surface Coal Mining (Open Cut Examiner)
Mines Rescue Team Member#	Certificate III in Mine Emergency Response and Rescue

Control Room Technicians/Operators#	Certificate III in Resource Processing Certificate III in Manufactured Mineral Products Certificate IV in Manufactured Mineral Products
Drillers, Drillers' Assistants	Certificate II in Mining Field/Exploration Operations Certificate II in Drilling Operations Certificate III in Drilling Operations Certificate IV in Drilling Operations
Drill Supervisors	Advanced Diploma of Drilling Management Diploma of Drilling Operations
Grade Controllers#	
Core/Corefarm Technicians#	
Mobile Plant Operators, Heavy Equipment Operators	Front End Loader, Crane, Forklift, Skid-steer, Bogger, IT Carrier, Backhoe
PARAPROFESSIONALS ROLES	
Draftspersons	Cert IV and Diploma in Engineering Drafting Certificate IV Drafting (Mining)
Warehousing and Logistics	Certificate III in Transport and Logistics Certificate IV in Warehousing and Logistics Bachelor of Business - Logistics and Supply Chain Management *
Front line Supervisors	Certificate IV in Frontline Management
Laboratory Technicians#	Certificate IV in Laboratory Operations
Administration Officers	Certificate III and IV in Business (Administration)
Health and Safety Advisors	Certificate IV in Occupational Health and Safety Diploma of Occupational Health and Safety Bachelor of Health Science (Safety and Health) Bachelor of Science (Health, Safety and Environment)
SPECIALIST ROLES	
Hoist Operators/Winder Drivers (underground mines only)	Winding Engine Driver's Certificate Class I and II examinations by DMP
Ventilation Officers (underground mines)	Surface Ventilation Technicians Course Certificate IV in Surface Ventilation Advanced Diploma in Mine Ventilation
Powerhouse Controllers	Diploma of ESI Generation (Systems Operations)
Railway Signal Maintainers	Certificate III in Transport and Logistics (Rail Infrastructure)
Train drivers	Certificate III in Transport and Logistics (Rail Operations)
Radiation Safety Officers	Bachelor of Science degree
MISCELLANEOUS ROLES	
Hospitality – Catering	Certificate III in Commercial Cookery
Hospitality –Cleaning	Certificate III in Asset Maintenance (Cleaning Operations)

#Denotes job roles for which training has traditionally been provided on the job.

Current and Emerging Skill/Labour Gaps

Mineral companies were asked to identify job roles which are hard to recruit due to, and including:

- Skills shortage prior to economic downturn, or
- Current skills shortage; or
- Inadequate-sized pool of suitable candidates; or
- Forecast strong demand which will likely lead to a skill shortage.

PROFESSIONAL ROLES

Engineering and Science
- Engineers (all disciplines)
- Geologists/Geotechnical Engineers
- Chemical/Process Engineers
- Risk Engineers
- Metallurgists

Business Improvement Managers
Contract Managers and Specialists
Health and Safety Advisors and Specialists
Engineering Drafting Technicians

PARAPROFESSIONAL ROLES

Purchasing, Transport and Logistics
Warehousing and Logistics Technicians
Procurement Officers

MISCELLANEOUS ROLES

Road Train/Truck Drivers
Train Drivers
Radiation Officers

OPERATOR/TECHNICIAN ROLES

Exploration and Drilling
- Drillers
- Drillers' Assistants

MAINTENANCE ROLES

Maintenance Planners
Maintenance Technicians
Maintenance Engineers (on and offshore)
Metal Trades
Metal Trades Apprentices
Electricians
Electrical and Instrumentation Trades
Electrical Team leaders and Supervisors
Fixed Plant Mechanics
Mobile Plant Mechanics

SPECIALIST ROLES

Powerhouse Controllers
Railway Signal Maintainers
Train Drivers

Operation Critical Job Roles

Mineral and petroleum companies were asked to identify job roles which, if not filled, would cause disruption to the achieving of core business. The following roles were identified.

MAINTENANCE ROLES

Electrical Supervisors
Electricians
Instrumentation Electricians/ Fitters
Fixed and Mobile Plant Mechanics

EMERGENCY RESPONSE ROLES

Medic Roles
Emergency Coordinator Roles
Emergency Team Member Roles
Fire & Rescue

MANAGEMENT AND PLANNING

Mine/Quarry Managers
Underground Shift Supervisors

OPERATOR TECHNICIAN ROLES

Control Room Operators
Refinery Process Superintendents/Controllers
Mineral/Refinery Processing Technicians/Operators

PORT AND SHIP LOADING ROLES

Hatch Officers
Ship Loader Operators

MISCELLANEOUS ROLES

Helicopter Landing Officer Roles
Train Drivers
Radiation Officers
Powerhouse Controllers
Winder Drivers
Shot Firers

Emerging Occupations

Uranium mining will require radiation safety officers who monitor radiation at mine sites. These officers must have a Bachelor of Science degree.

With the increase in automation of mining activities, one likely emerging occupation is that of automation technician. The most likely VET qualifications to provide some of the foundation skills and knowledge for this occupation are:

- UEE30807 Certificate III in Electrotechnology Electrician
- UEE31207 Certificate III in Instrumentation and Control
- MEM30405 Certificate III in Engineering – Electrical/Electronics
- UEE30207 Certificate III in Computer Systems Equipment
- UEE30907 Certificate III in Electronics and Communication
- UEE40607 Certificate IV in Electrotechnology Systems Electrician
- UEE40207 Certificate IV in Electrical Data and Voice Communication

- UEE40907 Certificate IV in Industrial Electronics and Control
- UEE40407 Certificate IV in Electrical Instrumentation
- MMEM40105 Certificate IV in Engineering
- UEE40107 Certificate IV in Computer Systems
- UEE40707 Certificate IV in Electronics and Communication.

Declining Occupations

- No declining occupations have been identified.

WORKFORCE SOURCES

There is a growing demand for skilled, safety-conscious people with initiative and team-working skills across the industry. Other personal attributes required include the ability to work in a team, communicate ideas, and have the resourcefulness to deliver results in remote, challenging situations. Pathways into the industry can commence through an apprenticeship, from TAFE, university and existing employment in a relevant industry. Entry-level skills may be acquired through relevant work experience such as mobile equipment operating, a trade certificate, technical diploma or a degree.

Prior to the 2008 global economic downturn, the resources sector had experienced some difficulty in recruiting and retaining skilled personnel and this was impacting on expansion projects and immediate productivity.[23] With the recovery of the resources sector and the large number of construction projects occurring around Australia, skill shortages are starting to re-emerge.

The resources sector has a number of large development projects under way or planned. The construction phase of these projects will require significant numbers of skilled tradespersons and labourers. It is estimated that 45,000 construction jobs and 10,500 permanent jobs will be created by these projects.

Major investment projects in the under-construction category are dominated by iron ore and LNG projects. Major Western Australia projects[24] include:

Project	Investment	Status	Construction Workforce	Operational Workforce
Gorgon Joint Venture	$43 billion	Committed	3,500	300
Kimberley Browse LNG Precinct	$30 billion	Committed	6,000	400
Chevron's Wheatstone LNG	$23 billion	Committed	5,000	400
Woodside's Pluto Train 1 LNG Plant	$12 billion	Commenced	4,000	200
Sino Iron's Pellet Project	$5.2 billion	Commenced	4,000	500
Woodside's North Rankin redevelopment	$5 billion	Committed		
BHP Billiton's Rapid Growth Project 5	$4.8 billion	Commenced		
Oakajee Port and Rail development	$4 billion	Committed	2,000	300
Western Areas' Flying Fox, Spotted Quoll and Lounge Lizard nickel projects	$3.8 billion	Committed		
Perdaman Chemicals' Coal to Urea Plant	$3.5 billion	Committed	1,500	200
Worsley Alumina's refinery expansion	$2.5 billion	Commenced	1,500	200

Australia is a highly urbanised country with approximately 89% of the population living in towns of 1,000 people or more. Over half of the population live in the five large coastal cities. Australia also has a relatively mobile population, with 17% of the population moving on average each year.

The combination of a preference for urban living and population mobility has led to migration away from the regional and remote areas.

Much of Australia's mineral wealth is located in the North-west and Eastern Goldfields regions which are remote and considered harsh environments. While in the past mining companies have constructed residential towns in these locations, it has become uneconomic to do so. Current practice has seen a reliance on long-distance commuting such as fly-in fly-out (FIFO) and drive-in drive-out (DIDO), all of which have replaced township development with residential camp development. Residential camps and townships differ in that camps are used solely for the purpose of accommodating and feeding the workforce, whereas townships provide the buildings and social infrastructure for not only employees but also their families and service providers.

[23] Chamber of Minerals and Energy, 2005, *Sustainable Minerals Sector Workforce*
[24] Department of Mines and Petroleum: *Prospect Magazine*; September - November 2010

Fly-in Fly-out (FIFO)

Whilst there is a strong business case for resource companies to employ local labour, FIFO employment is likely to be an increasing feature of resource sector operations. The high proportion of FIFO workers is due to a number of factors, including the lack of suitably skilled local people, lack of family accommodation, either available in the local community or provided by companies, and the desire of many mine personnel and their families to live in areas with greater amenities, such as cities.

From the beginning of the resources industry to the 1950s, numerous small mining towns were established. These towns were built as a response to the poor capacity and reliability of the transport systems to deliver employees, goods and services.

Historically, mining operations employed a township model. In the 1960s to mid-1980s the state's mineral boom relied on residential workforces. The development and management of many of these town sites were funded by the resource companies. Late in this period, company towns became part of the local government structure. From the mid-1980s to the present, in response to economic reform and global competitiveness pressures, the establishment of town sites was replaced by FIFO practices.

Throughout the world FIFO has replaced the development of residential townships as a means of accommodating employees (professional, skilled and unskilled) for remote resource operations. The last residential mining town constructed in Australia was Olympic Dam in South Australia, in the mid-1980s.

In the mid-1980s FIFO began to emerge as a cost-effective way to address skills shortages, to increase efficiency, and to avoid some of the social problems that can arise from developing a 'mining town'. The growth of the resources sector since that time, and the attendant pressure on local housing supply, has led to an increasing reliance on long-distance commuting.

It must also be recognised that FIFO provides opportunities for jobseekers living in communities where there are few local employment opportunities, thus contributing to the economy of those communities as well as the communities at the mine sites. FIFO is also appropriate for construction and expansion projects that initially require large numbers of people for a limited period of time.

About 50 per cent of the mining operations in Western Australia use FIFO. DIDO is a factor of the relative proximity of resource sector operations to large regional centres with pre-existing levels of social infrastructure, providing the necessary amenity for relatively large populations to develop with necessary economic stimulus from government and employment growth from industry.

FIFO rosters vary but common patterns are two weeks on, one week off, or nine days on with five days off. Domestic commute rosters are typically two days, two nights and five days off. Twelve-hour shifts are the common practice. Whilst many workers enjoy FIFO and the benefits it brings, there is also a higher than normal turnover in the FIFO workforce as some workers find the lifestyle difficult to maintain as family commitments increase.

FIFO will continue to be a response to local skills shortages. In reality, even if the issues relating to increasing participation of all unemployed and underemployed people, including women, Indigenous people, and older workers, are addressed, many remote and regional areas where the minerals and energy sector operates do not have a large enough local population of working age to meet the needs of the minerals and energy sector. In a nation with a diversity of regional growth, it is imperative that there be a balanced approach between FIFO and local community development.

In 2001 Professor Keith Storey identified factors inhibiting the development of new townships in remote locations including[25]:

- Costs of building and operating new resource towns;
- Absence of government financial support for township development;
- Longer lead time for new town approvals and construction;
- Environmental implications of new town construction;
- Administrative implications of managing a town;
- Increased costs associated with town closure once the resources have been exhausted or the operation is no longer viable.

Professor storey also identified the following as factors encouraging FIFO:

- Improved quality of communications;
- Improvements in the safety, reliability and cost of air travel;

[25] Australia Geographer, Vol. 32, No. 2, pp. 133-148: Storey, K. (2001) Fly-In/Fly-Out and Fly-Over: Mining And Regional Development In Western Australia

- Lower turnover and absenteeism levels in FIFO personnel;
- Preference for metropolitan over rural living by workers and their families.

With inadequate manpower within Western Australia's regional areas, most remote mine sites rely on fly-in fly-out. Employees who participate in fly-in fly-out are sourced primarily from Perth and Geraldton, with others being sourced from around Australia's major centres.

Sourcing Employees from Overseas

The resources industry has experienced difficulty in recruiting qualified and experienced professionals in a number of areas and has relied on Subclass 457 Business (Long Stay) visas to recruit personnel from overseas. The traditional source countries for migrants in the minerals industry have been the United Kingdom, North America, New Zealand and South Africa. Professionals that have been sourced from overseas include geologists, mining engineers, geophysicists, mechanical engineering technicians, engineering managers, civil engineers, mechanical engineers and metal fabricators.

The following table contains Australian Migration Program Outcomes for 2005-06 to 2008-09 and planning levels for 2009-11[26].

Category	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Employer Sponsored	15,230	16,590	23,760	38,030	35,000	44,150
Skilled Independent	49,860	54,180	55,890	44,590	41,600	35,200
State/Territory Sponsored	8,020	6,930	7,530	14,060	11,200	23,000
Skilled Australian Sponsored	19,060	14,170	14,580	10,500	12,300	3,500
Distinguished Talent	100	230	210	200	200	200
Business Skills	5,060	5,840	6,570	7,400	7,800	7,800
Total Skill	97,340	97,920	108,540	114,780	108,100	113,850

Western Australia led in the number of 457 visas being issued for the mining sector. Also mining was the lead industry in 457-visa applications within Western Australia.

Number of 457 applications granted in 2009-10 to 31 May 2010 by sponsor industry and state[27]

Sponsor Industry	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Not Spec	Total
Mining	<5	130	60	470	50	10	120	1390	10	2250
Construction	10	850	30	580	50	10	370	1080	<5	2980
Health Care and Social Assistance	180	1530	30	1000	690	160	1690	740	10	6040
Other Services	30	1360	20	190	60	<5	650	270	<5	2580
Manufacturing	10	590	20	320	70	10	450	260	0	1730
Education and Training	120	400	10	380	90	20	540	240	<5	1810
Accommodation and Food Services	30	320	20	170	20	10	200	140	0	890
Electricity, Gas, Water and Waste Services	<5	90	10	70	10	<5	100	140	0	420
Financial and Insurance Services	<5	1130	10	130	20	<5	400	110	<5	1800
Information, Media and Telecommunications	40	2070	20	140	20	<5	1000	110	0	3390
Rental, Hiring and Real Estate Services	10	750	10	140	20	<5	830	110	<5	1860
Retail Trade	20	270	10	130	20	<5	280	110	0	830
Public Administration and Safety	40	260	170	90	40	20	150	70	0	840
Transport, Postal and Warehousing	<5	160	10	60	10	<5	120	70	0	430
Agriculture, Forestry and Fishing	<5	100	10	140	100	10	110	60	0	530
Professional, Scientific and Technical	20	370	10	100	20	<5	150	60	20	750
Wholesale Trade	0	310	<5	50	20	0	180	60	0	620
Not Recorded	<5	170	<5	70	60	10	80	60	40	500

[26] Department of Immigration: www.immi.gov.au/media/statistics/statistical-info/visa-grants/migrant.htm
[27] Department of Immigration: http://www.immi.gov.au/media/statistics/pdf/457-stats-state-territory-may10.pdf

Arts and Recreation Services	10	240	<5	30	50	<5	130	20	0	480
Administrative and Support Services	10	190	20	10	10	0	20	10	0	270
Total	540	11280	450	4270	1430	260	7550	5100	90	30970

In 2009-10, Western Australian mining companies accounted for 27.3% (1,390) of the total employer-sponsored visa applications in Western Australia. This is down 46.4% on the 2008-09 figure of 2,600 applications.

EDUCATION AND TRAINING

The overriding legislation for the mining industry is the Mines Safety and Inspection Act and the supporting Regulations. The Regulations specify that employees must be provided with training in systems of work and assessed before commencing work at the mine site, and must be retrained whenever new systems of work or equipment are introduced. The Mines Safety and Inspection Regulations 1995 state:

4.13 . Induction and training of employees

(1) Each responsible person at a mine must ensure that every employee is —

(a) given adequate instruction and training in safety procedures and systems of work and in the tasks required of the employee;

(b) assessed before commencing work at the mine to ensure that the employee is competent to perform the tasks he or she will be assigned and to operate any plant and equipment the employee will be required to operate; and

(c) retrained and reassessed whenever systems of work or plant and equipment are changed, or new systems of work or plant and equipment are introduced.

(2) Each responsible person at a mine must ensure that —

(a) a record is made of any instruction, training, retraining, assessment or reassessment given as required under this regulation; and

(b) the record is kept for a minimum of 2 years after it is made.

The resources sector typically recruits individuals over the age of 18. Although this is not a legislative requirement (other than for working underground), the industry links maturity to safety behaviour. The resources sector places a high level of importance on the skills of its workforce, which contributes to the safety and productivity performance. The industry expends a large amount of money skilling and up-skilling its workforce. The industry allocates by far the highest expenditure per employee ($1,643) on training of any industry in Australia[28].

There is an adequate number of training providers but there is a question as to the quality of the training and assessment being provided. The industry links quality training and assessment to improved safety behaviour and increased production and does not see a need to train for the sake of proving employees with qualifications, although some use the opportunity to gain a qualification as an employee retention strategy. Given the level of risk to equipment and personnel of incompetent operators, the quality of training is paramount and the validity and integrity of the assessment process is critical.

Most in-house training is provided to the operator and technician-level employees as there has been inadequate pre-employment training available that will equip recruits to be work ready. There is a preference for on-the-job training so that training and assessment can be directly linked to the equipment being utilised by the individual and to the company's standards.

Industry Qualifications Overview

The following are the VET sector qualifications that are directly related to the resources sector.

- Certificate II in Process Plant Operations
- Certificate III in Process Plant Operations
- Certificate II in Drilling Operations
- Certificate II in Drilling Oil/Gas (Off shore
- Certificate II in Drilling Oil/Gas (On shore)
- Certificate II in Surface Extraction Operations
- Certificate II in Underground Metalliferous Mining
- Certificate II in Resource Processing
- Certificate II in Mining Exploration

[28] ABS *Employer Training Expenditure and Practices* 6362 0 2001 – 02

- Certificate III in Mining Field/Exploration Operations
- Certificate III in Surface Extraction Operations
- Certificate III in Underground Metalliferous Mining
- Certificate III in Resource Processing
- Certificate III in Mine Emergency Response and Rescue
- Certificate III in Drilling Operations
- Certificate IV in Mine Ventilation
- Diploma of Mine Ventilation
- Advanced Diploma in Mine Ventilation
- Certificate II in Manufactured Mineral Products
- Certificate III in Manufactured Mineral Products
- Certificate IV in Manufactured Mineral Products
- Diploma of Manufactured Mineral Products
- Advanced Diploma of Manufactured Mineral Products
- Certificate IV in Surveying (Mining)

The following are certificates which are issued by the Department of Mines and Petroleum and which are outside the Australian nationally recognised training system.

- First Class Mine Manager's Certificate
- Quarry Manager's Certificate
- Underground Supervisor's Certificate
- Deputy's Certificate
- Restricted Quarry Manager's Certificate
- Winding Engine Driver's Certificate - Class I
- Winding Engine Driver's Certificate - Class II.

The following are just a few of the VET qualifications utilised by, but not restricted to, the resources sector.

- Certificate III in Commercial Cookery
- Certificate III in Electrotechnology Electrician
- Certificate III in Engineering – Electrical/Electronic Trade
- Certificate III in Engineering – Mechanical (Maintenance Diesel Fitting)
- Certificate III in Instrumentation and Control
- Certificate IV in Frontline Management
- Certificate IV in Occupational Health and Safety
- Certificate IV in Transport and Logistics (Rail Infrastructure)
- Certificate IV in Transport and Logistics (Rail Operations)
- Diploma in Engineering Drafting
- Diploma in Project Management
- Diploma of Engineering – Advanced Trade (Mechanical and Electrical)
- Diploma of Surveying.

University Education

The resources sector relies heavily on the university sector for its professional-level employees. Graduates are attracted to companies that provide high-quality graduate programs. These graduate programs build on the knowledge gained at university and usually involve rotation through a number of job roles and mine sites to provide the graduate with a greater understanding of the company/industry and enable the development of practical skills. Companies use their graduate programs to attract the pick of the graduates.

The following professions are utilised in the resources sector:

- Engineering including Civil, Mining, Chemical, Materials, Mechanical, Completions, Drilling, Electrical/Instrumentation Control, Pipeline, etc.
- Chemists and scientists
- Metallurgists
- Geologists
- Health and Safety
- Surveyors
- Mining Drafting technicians
- Environmentalists.

The following are not employed in large numbers, nor are they seen as mission critical:

- Archaeologists
- Biologists
- Lawyers
- Heritage Officers.

As with any other large enterprises, the typical job roles required to run an efficient organisation include the following (note that these are not in short supply):

- Human resources and industrial relations
- Public relations – media, communication, community liaison, etc.
- Finance and commercial professionals
- Information technology – programmers, network support, software support
- Sales and marketing
- Procurement and logistics.

Future Directions for Education and Training

Resource companies have had a strong tradition in providing training to operational employees. This training typically occurs on the job: utilising peers to train new employees. Workplace assessment of competency is normal practice for the industry, with new employees being required to demonstrate competency in equipment operation and safe task completion before being able to work under limited supervision.

Employers are becoming more aware of traineeships and public funding that is available for existing and new workers through the Productivity Placement Program (PPP). For the PPP to be successful, training providers will need to become more flexible and responsive to industry needs which will lead to an increased confidence in the VET sector. There is an expected growth in demand for publicly-funded training by the resources industries.

TECHNOLOGY

Automation in the mining industry is not new but, with advancement in technology, the degree of automation and the areas of impact have increased. For many years process plants have been controlled by a centralised control room with valves, pump, chemical additives, flow rates etc., being remotely operated and configured to suit optimal recovery rates. This automation is being expanded into the operation of the mobile fleet, leading to driverless trains, loaders, trucks and drills. With the increase in data communication technology, the control room has become increasingly separated from the physical action.

Rio Tinto has commissioned an automated mine-to-port iron ore operation. The Pilbara mine operation is controlled 1,300 kilometres away at a new centre in Perth. Remote control 'intelligent' drills are used in preparation for blasting; a driverless 'intelligent' truck fleet transports ore to stockpiles; driverless trains carry iron ore to the port. A Remote Operations Centre (ROC) near Perth's domestic airport houses employees who will work with Pilbara-based colleagues to oversee, operate and optimise the use of key assets and processes, including all mines, processing plants, the rail network, ports and power plants. Operational planning and scheduling functions will also be based in the ROC.

A number of key technologies have been introduced on a staged basis, beginning in 2006 with the development of autonomous drilling rigs for the Pilbara. In early 2007, Rio Tinto established and funded on a long-term basis the Rio Tinto Centre for Mine Automation in partnership with the University of Sydney. Under this partnership Rio Tinto has secured exclusive access to world renowned robotics experts dedicated to addressing Rio Tinto's 'mine of the future' opportunities.

The skill sets for miners of the future will be less about operator tickets and physical capacity and more about technology skills and aptitude for technology change. One trade will become even more in demand, i.e. electrical instrumentation technicians who will be responsible for installing and maintaining automated systems. A new job role of automation technician may arise which will have a blend of resources processing and automation technical skills.

Other changes in resource processing are new technologies such as heap leaching, electrowinning and bacterial processing which will continue to have an impact on the nature of mineral deposits considered viable. The skill sets required to introduce these new technologies will need to be addressed by the industry.

Forecasting Labour and Skills Demand and Supply

The Chamber of Minerals and Energy (CME), as a representative organisation for the Western Australian minerals and energy sector, commissioned a joint industry-government Growth Outlook study to provide an integrated outlook on industry and government development plans in the minerals and energy sector. It focused on the key growth enablers of people, energy and water. The resulting report, *Developing a Growth Outlook for WA's Minerals and Energy Industry,* contains three growth scenarios. These scenarios were utilised as a basis for recommendations in this workforce plan, with a focus on the moderately constrained growth which forecast a softer impact of the global financial crisis on the minerals and energy sector.

Based on surveyed data, state-wide demand for labour from the minerals and energy sector is projected to grow significantly for the period 2008-14, with a peak demand of 38,000 in 2012. The majority of this growth is expected in the Pilbara and Mid-west regions where new and expanding projects, in particular iron ore, are planned. Under the constrained growth scenarios, growth is generally static for the period 2008-10, followed by high rebound growth for the period 2011-14.

Survey Outcomes[29]

- State-wide direct labour demand from the minerals and energy sector is projected to grow at a compound annual growth rate of 7% to 27,000 by 2014.
- The direct minerals and energy sector labour demand is expected to peak in 2012 at ~38,000, driven by the coincident timing of a number of major construction projects in the state.
- The highest growth regions are expected to be the Mid-west, Goldfields/Esperance and the Pilbara, with respective incremental demands of 60,000, 3,000 and 14,000 in 2014 over 2007 levels.
- The majority of additional planned employees are FIFO workers, with a peak incremental requirement of 27,000 in 2012 compared with a residential workforce requirement of 11,000 in the same period.

Constrained Growth Scenarios

- The moderate constrained growth scenario forecasts relatively slow growth in state-wide direct sector demand for the period 2008-10, followed by a sharp upturn in 2011. Incremental demand in 2012 under this scenario is ~38,000.
- The severe constrained growth scenario forecasts flat or negative growth in state-wide direct sector demand for the period 2008-11, followed by a sharp upturn in 2012. Incremental demand in 2012 under this scenario is ~17,500.

Implications and Opportunities

There are a number of implications and opportunities associated with the forecast rapid growth in labour demand.

- Increased social and economic benefits for the state will flow from the planned significant investment and growth in the mining, resources and energy sector.
- The competitiveness of Perth and regional Western Australia to attract and retain the suitably skilled labour to meet forecast demands remains a challenge.
- Increased minerals and energy sector labour demand is likely to continue to put increased strain on other industry labour resources and upward pressure on labour costs.
- Strong population growth will continue to place pressure on civil infrastructure in Perth and regional towns.
- A number of challenges will be associated with the expectation that the majority of forecast sector labour demand will be met through fly-in-fly-out.
- The forecast ongoing rapid growth will continue to put pressure on maintaining a balance between development and conservation of biodiversity and the environment.

Future Labour Demands

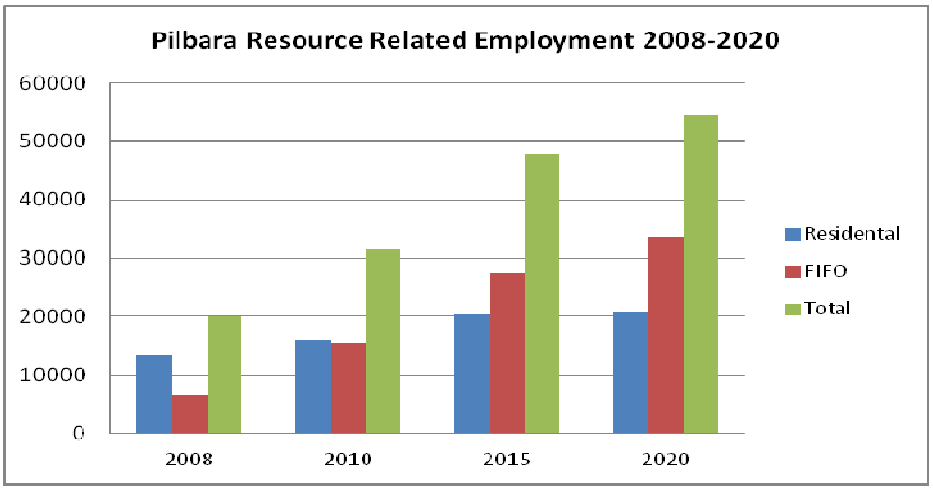
The Pilbara Industry's Community Council's April 2010 report *Planning for resources growth in the Pilbara: revised employment & population projections to 2020* has estimated the growth in employment in the mining sector for the Pilbara region up to 2020.

Based on information available as at March 2010, total operational resource-related employment in the Pilbara is projected to grow from some 19,000 in 2008 to some 47,000 in 2015, reaching 53,000+ by 2020. These totals include local jobs required to support direct employment in the

[29] Chamber of Minerals and Energy: *Developing a Growth Outlook for WA's Minerals and Energy Industry 2009*

Pilbara and FIFO positions, but exclude construction workforce numbers which are shown separately. Residential employment is projected to increase by 28 per cent between 2010 and 2015, from 15,900 to some 20,300, with growth moderating thereafter[30].

FIFO projections for the Pilbara region are projected to grow at a faster rate, increasing by 83 per cent between 2010 and 2015 and by a further 23 per cent to 2020.



In 2008 there was a majority of people employed under residential conditions but in 2010 the percentage of residential and FIFO employees is close to equal. By 2020 it is expected that 62 per cent of the workforce will be FIFO. By 2015 92 per cent of FIFO workers will be in the iron ore sector[31].

	Residential	FIFO
2008	66%	34%
2010	51%	49%
2015	42%	58%
2020	38%	62%

Projected construction employment in the Pilbara is over 22,000 in 2010, peaking at some 28,000 in 2012 and dropping sharply away from 2015 onwards. These numbers are likely to be conservative because a number of companies have chosen to include expansion/new projects only at an advanced planning or approvals stage. Nearly all of these workers can be expected to be FIFO.

[30] This moderation may be partly explained by company estimates not including expansion plans for later in the projection period.
[31] Pilbara Industry's Community Council's April 2010 report '*Planning for resources growth in the Pilbara: revised employment & population projections to 2020*'

Action Plan

Labour market and supply

Local Apprenticeships

With the cost of accommodation in the Pilbara reaching beyond $1200 per week, individuals contemplating taking on an apprenticeship or traineeship are unable to find affordable accommodation and are therefore unable to undertake an apprenticeship unless they are lucky enough to obtain one with a company which provides accommodation. Typically, the government, small to medium enterprises and not-for-profit organisations cannot afford to provide accommodation for employees or apprentices.

Apprentice Numbers

Low apprentice numbers are a concern to the government but employers are reluctant to sign up apprentices for a number of reasons including:

- Vocational Education and Training Act 1996 - Sect 60G;
- Concerns over their ability to provide on-the-job coverage for the entire apprenticeship;
- Concerns over their ability to provide adequate supervision;
- Concerns over the reduction in the duration of apprenticeships and their ability to provide the necessary training in a shortened period of time.

To address their concerns over section 60G of the Vocational Education and Training Act 1996, many employers utilised labour-hire apprentices sourced from Group Training Organisations.

Pre-employment Training

Pre-employment training programs aimed to equip new entrants into the resources industry are not as yet valued by the industry. Feedback highlights the lack of practical industry experience, and a lack of focus on safety behaviours in institutionalised training courses is producing graduates without the necessary skills required for employment.
Pre-employment courses in the mining sector include:

- RII10109 Certificate I in Resources and Infrastructure Operations,
- RII20109 Certificate II in Resources and Infrastructure Work Preparation.

Although the industry does not consider that the current pre-employment courses equip the individual to be a work-ready employee, some employers do look at the completion of one of these programs as a demonstration of commitment to the industry and will look more favourably on job applicants who have completed a course over similarly inexperienced applicants who have not completed a course.

The lack of industry-recognised entry-level training impacts on the ability of jobseekers to identify pathways into the sector, resulting in examples of training being undertaken with no employment outcome. This is sometimes due to the lack of industry-relevant work experience and working conditions during training.
The lack of employment outcomes frustrates jobseekers, training providers and employers. An understanding of the way the minerals sector operates, its skills needs and its recruitment practices, is necessary for any entry level-training to be considered as relevant and appropriate by employers.

Migrants Skills Under-utilised

Many migrants may have skills in areas that the sector values, but individuals are rarely put forward for consideration by job service providers. The employment services currently provided by Job Network providers must be reviewed with the intention of providing a more tailored and case-based approach to securing employment for refugees.

Affordable Accommodation

Many people choose not to seek employment in the resources sector, particularly if it involves relocating from a metropolitan area to a regional area or interstate. There are financial barriers to relocation to remote and regional areas, and concerns over return on investment and effects on the family. There are also other key factors which militate against mobility to areas of minerals and energy operation. These include housing affordability, for example in Perth and regional Western Australia; housing availability, for example in the Pilbara and other regional centres; regional infrastructure issues; schooling and childcare availability; and concerns or lack of knowledge about the family and social impacts of intra/interstate migration or a FIFO lifestyle. The cost of petrol is an average of 30 cents per litre more in the Pilbara than Perth.

In the mid-1970s and 80s caravan parks served transient workers who elected to stay in the region for periods of one to three years. Caravanning allowed workers to bring their families to the region and move between towns to find work. Most of the Pilbara caravan parks have been taken over to house FIFO employees and, in one instance, tenants who had been resident in one caravan park for many years were evicted so that the park could be redeveloped to house FIFO workers for one of the local mining companies. Many of those evicted tenants have no legal place to relocate to and so illegal and substandard camping is developing. Most caravan parks are currently fully booked with no available bays for new workers, tourists or families wishing to give employment in the regions a try.

Hours of Work

The minerals sector has a culture of full-time work and long hours which impacts on its ability to attract and retain people. Twelve to fourteen-hour days and rosters for anywhere between five days and three weeks can be found.

FIFO and Perceived Unattractive Lifestyle

FIFO employment is becoming the main method of employment for many remote operations. This requires employees to be transported to the exploration site, mine site or platform for the duration of their swing. A swing may consist from five to 21 days onsite followed by a period of time when employees are transported back to a major centre/airport for a period of rest and recreation with their family. Some conditions at FIFO sites make working in the industry unattractive.

- Fear of flying — Planes are used to transport personnel to remote and regional sites.
- Working away from family — The inability to attend some family functions and celebrations may result in employees missing significant events or not being available to provide support during times of need.
- Shift work and rosters — These may not enable employees to meet religious obligations; for example the need to practise the Sabbath or attend prayer services.
- Working at heights — Many process plants require working at heights.

Relocation to Engage in Regional Residential Employment

Residential employment requires an employee to be located in the local town or community. These towns and communities are typically remotely located and it is expected that the employee will relocate to the area with their family. If an employee chooses not to relocate, transport to and from the town site or community is not funded so employees must pay for their own transport.

Conditions that may prevent individuals from applying for residential mining employment include:

- Establishing new residence — There may be reluctance to sell a current home to purchase housing in an area perceived as an investment risk or of a less desirable standard.
- Reluctance to relocate family — There may be issues with the quality of education, housing, medical facilities and social infrastructure.
- Heat, dirt and dust — The harsh environment, when compared to the wages, is not always seen as attractive if the family is subjected to the same conditions.
- Life of a mine — Employees who relocate to the area may have concerns over recovering any financial investment in housing towards the end of mine life.
- Child and after school care — With no extended family to provide support, and with 10 to 12 hours a day shifts being the norm, childcare and after school facilities may not be adequate. There is a need for 24/7 subsidised childcare as most employees do not have an extended family in the area which they can rely on to assist with childcare.

- Regional infrastructure — The limited supply or costs of water, energy, transport and affordable housing make relocating to regional Western Australia unattractive. The lack of quality local high-school education and access to university education can be a prohibiting factor in families wanting to relocate.

Issue	Strategies	Measure of success
Entry into the industry Many people are not sure how to obtain employment in the mining industry.	1. The Chamber of Minerals and Energy's People for the Future website and the Unearthing People for the Future career expo aim to attract people into the industry via the provision of careers advice. 2. The RITC could develop brochures on career opportunities and a *How to get into the industry* flyer.	1. The number of hits to the website and the numbers who attend the careers expo. **Responsible parties**: CME. Flyers are available to inform individuals how to gain employment in the mining industry. **Responsible parties:** RITC or CME. **Priority:** High.
Issues with quality of pre-employment training Many graduates from mining training programs provided by RTOs are not work ready and, although they hold various mobile plant tickets/certificates, employers do not consider them competent in the workplace.	1. Give training providers the opportunity to provide industry with an overview of how they train, what practical experience is involved and what work experience is required before graduates are issued with certification. An industry panel will then assess the delivery programs and draw up a list of preferred providers or issue guidelines for training delivery. This list of preferred providers will be hosted on the CME or RITC websites, as will an overview of the licences and certificates preferred by the WA mining employers.	1. A description of how the mining industry prefers pre-employment training to occur is listed on the RITC or CME websites along with the details of training providers who comply with the guidelines. **Responsible parties:** RITC or CME. **Priority:** High.
Attracting local apprentices With the high cost of accommodation in the Pilbara and the low apprentice wages, local individuals cannot afford to take on an apprenticeship if accommodation is not supplied.	1. The local shire could consider building a caravan park. The shire is able to fast track the development of a caravan park which is reserved for private and tourist usage rather than focusing on providing accommodation for just one company. 2. The shire or state government can consider the establishment of affordable dormitory-style accommodation for single workers such as apprentices.	1. Adequate affordable accommodation is available in the main Pilbara townships. **Responsible parties:** Shire of Roebourne, Shire of Port Hedland, WA state government. **Priority:** High.
Pre-employment training Concern over the quality and consistency of pre-employment training that is occurring.	1. The RITC to seek the level of support amongst mining companies for a WA entry-level qualification which, once developed, will be monitored by the industry to ensure an ongoing level of quality. The contents of the training program will be linked to the RII qualifications and provide additional skills identified by the WA employers.	1. Support for a training program is identified. **Responsible parties:** RITC. **Priority:** High. 2. If supported by industry, then a training program is established. **Responsible parties:** RITC.
Migrant skills not utilised fully Many migrants may have skills in areas the sector values but individuals are rarely put forward for employment in the sector.	1. The Chamber of Minerals and Energy could conduct a review of the changes and the effectiveness after a period of 12 months. 2. Job Network providers need to be encouraged to seek opportunities for new Australian clients based on their qualifications and experience. Job Network providers must be given an incentive to utilise their resources in such a way that they can differentiate between skilled and unskilled individuals.	1. The WA and national skilled migration list reflects the WA mining industry skill shortages. **Responsible parties:** CME, CCI, Department of Training and Workforce Development. **Priority:** High. More skilled migrants are engaged in employment in the resources sector. **Responsible parties:** Job Network providers.

Issue	Strategies	Measure of success
		Priority: High.
Affordable accommodation Many people choose not to seek employment in the resources sector, particularly if it involves relocating from a metropolitan area to a regional area or interstate.	1. The state and Commonwealth governments could implement an infrastructure program to provide affordable water, affordable electricity, adequate transportation, and access to quality hospitals, libraries, schools and university campuses in the regional areas to help attract people. 2. The state government could develop and fund public awareness campaigns to be delivered to the eastern states with the aim of raising awareness of the lifestyle, job and career opportunities in the regional areas of Western Australia. 3. The Commonwealth government could consider taxation incentives to offset the additional costs of living in the regional areas of Western Australia. 4. Both state and Commonwealth governments could consider the release of affordable land in the regional areas, with tax incentives to offset the additional cost of construction. 5. The state and Commonwealth governments could support the development of affordable 27/4 childcare facilities and recreational facilities to support shift workers. They could consider making 100% of the costs of childcare tax deductible if both parents are in full-time employment. 6. Mining companies could consider reintroducing the home purchasing scheme available in the 1980s, whereby employees who work for the company for 15 or more years had the right to purchase the company house in which they had lived at the market price set at the date of occupancy. 7. Local, state and Commonwealth governments could look at ways of encouraging companies to support residential employment and making FIFO accommodation less attractive. 8. The shire could consider building a caravan park. The shire is able to fast-track the development of a caravan park which is reserved for private and tourist usage rather than focusing on providing employee accommodation for just one company. 9. The shire or state government to consider the establishment of affordable dormitory-style accommodation for single workers such as apprentices.	1. Regional infrastructure (hard and soft) has been improved to make regional Western Australia a place of desirable residency and employment. **Responsible parties**: state and Commonwealth governments. **Priority:** High. 2. Home ownership schemes are reintroduced for Pilbara-based employees. **Responsible parties**: Enterprises. **Priority:** High. 3. Financial incentives to offset additional costs of living are provided. **Responsible parties**: state and Commonwealth governments. **Priority:** High. 4. Residential numbers increased in the Pilbara and Mid-west regions. **Responsible parties**: governments and enterprises. **Priority:** High.
Hours of work The minerals sector has a culture of full-time work and long hours which impacts on its ability to attract and retain people.	1. Industry could reconsider the 12 hour shifts and roster cycles to suit people with a preference for daily work/life balance. With shorter shifts there may be an increase in safety performance due to less fatigue being	1. Shorter shifts (40 hour week) being the norm for the industry, including shifts for FIFO workers.

Issue	Strategies	Measure of success
	experienced. 2. Review rosters to include the option for equal time rosters.	**Responsible parties:** Enterprises. **Priority:** Medium. 2. Equal time rosters are the norm for the industry, including for FIFO workers. **Responsible parties:** Enterprises. **Priority:** Medium.
FIFO and Perceived Unattractive Lifestyle • Some conditions at fly-in fly-out sites make working in the industry unattractive.	1. State government to fund research into FIFO. Look into the various roster cycles, the degree of usage, effects on the community and family, the value to employers and cost and benefits to regional communities. 2. State government could fund courses in overcoming fear of flying or working at heights. 3. State government to review the adequacy of community support available for families affected by FIFO.	1. More community groups find FIFO an acceptable form of employment. **Responsible parties:** Enterprises, CME WA, state government. **Priority:** Medium.
Relocation to engage in regional residential employment Residential employment conditions may prevent individuals from applying for residential mining employment.	1. State and Commonwealth governments can play a part in minimising the costs of relocation by introducing tax and financial incentives for families to relocate to the regional areas where employment opportunities exist. The regional tax allowances need to be reviewed to more accurately reflect the additional costs of living in regional Western Australia. 2. State and Commonwealth governments both have a role to play in ensuring hard and soft regional infrastructure is of the same level as metropolitan Western Australia.	1. The cost of housing and living in regional WA is no greater than metropolitan Perth. **Responsible parties**: State and Commonwealth governments. **Priority:** High. 2. The affordable soft and hard infrastructure required to encourage families to relocate to regional communities is available. **Responsible parties**: Local, state and Commonwealth governments. **Priority:** High. 3. There is an increase in the number of families relocating to the regional areas where unemployment figure are low. **Responsible parties**: Enterprises, local, state and Commonwealth governments. **Priority:** Medium.
Fall in apprentice numbers Some companies are reluctant to take on apprentices as the VET Act complicates and delays the process of terminating an apprentice.	1. Review Section 60G of the Vocational Education and Training Act 1996 to enable an employer to terminate a training contract if an apprentice is in breach of company drug and alcohol policies or is in breach of the health and safety policy or legislation.	2. The VET Act is amended to enable employers to terminate a training contract if the apprentice has been found to be in breach of a safety-related policy. **Responsible parties**: Department of Training and Workforce Development, state government. **Priority:** High.

WORKFORCE PARTICIPATION

In Western Australia, the Indigenous labour participation rate lags behind that of the non-Indigenous population. While there have been improvements over recent years, the fact still remains that Indigenous labour force participation is about three-quarters of that for non-Indigenous people at both the state and national levels[32].

Mining companies contribute to Indigenous employment via support for contracting businesses, either directly through Indigenous contracting businesses, or by stipulating the use of Indigenous labour quotas for other contractors. The setting of targets and quotas has proved mildly successful but they are cost-prohibitive for many small to medium enterprises.

There are many reasons why people decide not to participate in employment. Factors specifically affecting Indigenous people include:

- Education levels are generally below that of the broader population;
- The health status in terms of issues such as cardiovascular health, diabetes, drug and alcohol use, etc prevents them from being 'work ready';
- Significant numbers of Indigenous people live in remote regional areas or very remote communities;
- Indigenous people have different cultural priorities which may be reflected in the choices they make regarding employment outside their communities;
- A history of welfare dependency may impact in a negative way;
- They may be engaged in activities outside of the labour force through participation in traditional or customary activities[33].

Work Readiness

Indigenous employment is not only about creating jobs, but also about getting people work-ready. Factors that prevent individuals from being work-ready include health, fitness, lack of education and a lack of skills, as well as poor levels of literacy and numeracy.

There is a need to lift Indigenous literacy and numeracy levels and this can only be achieved through customised programs that are industry and regionally specific and have a vocational bias.

The health of Indigenous people has been a barrier to entering the labour force, particularly in the mining industry. The mining industry has a fitness-for-work requirement which includes medical health as well as drug and alcohol-free requirements. With 60 per cent of mining activity being close to remote communities, the mining industry has the potential to lead in Indigenous labour force participation if the health issues can be addressed.

Employment Quotas

Mining companies have set hard targets for Indigenous employment within their own and contractor employees. The setting of targets and quotas has proved mildly successful but these are cost-prohibitive for many small to medium enterprises. There is a role for state and Commonwealth governments to help fund employers to implement quotas. Suggestions include:

- Commonwealth and state-based tax exemptions/subsidies for employers, e.g. payroll tax exemption;
- Royalties for regions money could be used to subsidise employment;
- Government could offer subsidies/assistance for programs which have a demonstrated success;
- In addition to direct employment and insisting that contracting companies employ Indigenous people, state and Commonwealth governments and local enterprises should work with Indigenous individuals and groups to develop viable business enterprises, particularly contracting businesses.

32 Productivity Commission 2007, pp 3.39-3.47
33 Productivity Commission 2007, p 3.40

Mining Company Pre-employment Programs

Mining companies often have structured pre-employment programs for Indigenous individuals. These programs assist companies to identify potential employees and also go part of the way in addressing the issues of literacy and numeracy and preparing participants for work. Government funding should be made available for company-provided Indigenous pre-employment training programs.

Local Mentoring Services

State and Commonwealth governments should consider the ongoing funding for the establishment and provision of local education and employment mentoring services. These services would assist in keeping individuals engaged in training and employment and act as a link between the Indigenous community, education providers and employers.

Issue	Strategies	Measure of success
Indigenous participation Despite the efforts of many resource companies and training providers, the Indigenous labour participation rate lags behind that of the non-Indigenous population.	1. State government to fund research into the various resource companies' Indigenous development and employment strategies and publish a 'lessons learnt' document. 3. State governments to look into ways to improve the standard and level of educational achievement in the Indigenous population. 4. Vocational Education and Training needs to be better tailored to the needs of industry and the specific regions, including the provision of access to this training in remote areas. 1. A continued commitment to expanding Indigenous employment and training programs as an ongoing priority for resource companies and contractors, coupled with a commitment to attracting and recruiting more local people into their workforces.	1. Well informed research is conducted which documents the history, successes and failures of companies' attempts to build the capacity of Indigenous individuals and communities. **Responsible parties:** State government. **Priority:** Medium.
Indigenous health The health of Indigenous people has been a barrier to entering the labour force.	1. State and Commonwealth governments have a role to play in lifting the health of Indigenous communities through the provision of health care professionals and adequate health resources as well as funding intervention and education programs. These programs need to address issues such as diet and fitness, as well as drug and alcohol intervention.	1. More Indigenous individuals are able to meet the fitness-for-work requirements of the resource sector. **Responsible parties:** Local, state and Commonwealth governments. **Priority:** Medium.
Indigenous economic development Despite 40 years of substantial economic development in the Pilbara region and commitments to education, training and employment programs, the labour force status of Indigenous people has barely altered (Taylor & Scambary Report)[34].	1. State and Commonwealth governments and local enterprises to work with Indigenous individuals and groups to develop viable business enterprises, particularly contracting businesses. 2. Mining companies to set hard targets for Indigenous employment within own and contractor businesses. The setting of targets and quotas has proved mildly successful but these are cost-prohibitive for many small to medium enterprises. There is a role for state and Commonwealth governments to help fund employers to implement quotas. Suggestions include: • Commonwealth and state-based tax exemptions/subsidies for employers such as payroll tax exemption; • Royalties for regions money could be used to subsidise employment; • Government could offer subsidies/assistance for programs which have a demonstrated success.	3. Indigenous groups are equipped with the skills and knowledge to establish and operate financially viable service companies. **Responsible parties:** State government. **Priority:** Medium. 4. Mining companies have a preference to buy goods and services locally. **Responsible parties**: Enterprise. 5. Companies have a preference to engage Indigenous contracting companies where they exist and can provide the service required. **Responsible parties**: Enterprise.

[34] Taylor & Scambary (2005), *Indigenous people and the Pilbara mining boom: A baseline for regional participation*

Issue	Strategies	Measure of success
	3. Mining companies to be eligible for government funding for their Indigenous pre-employment training programs. 4. State and Commonwealth governments to consider ongoing funding for the establishment and provision of local education and employment mentoring services. These services would assist in keeping individuals engaged in training and employment and act as a link between the Indigenous community, education providers and employers. 5. Mining companies contribute to Indigenous employment via support for contracting businesses, either directly through Indigenous contracting businesses, or by stipulating the use of Indigenous labour quotas for other contractors. 6. There is a need to lift Indigenous literacy and numeracy levels and this can only be achieved through customised programs that are industry and regionally specific and have a vocational bias. Specialised programs need to be developed with industry and Indigenous involvement. The Department of Training and Workforce Development will need to coordinate the development and delivery of these specific programs. 7. A Department of Training and Workforce Development and Department of Education taskforce could be established to pursue the longer term objective of examining the education system as it specifically relates to Indigenous people to ensure their needs are being met. 8. A coordinated government/industry body to examine the most successful aspects of the above to determine best practice behaviour in this area and drive links between industry and government in continuing to build on the successes to date. 9. Regional Development Commissions to continue with their Indigenous development programs and consider developing business capacity within the local Indigenous community for the provision of services that mining companies would find useful, for example road construction and maintenance, drilling services and environmental restoration.	**Priority:** Medium. 6. Companies have a preference for engaging contracting companies who have a positive Indigenous employment practice. **Responsible parties**: Enterprise. **Priority:** Medium. 7. An effective Government-funded mentoring service is provided in each of the major regional towns. **Responsible parties**: State and Commonwealth governments. **Priority:** Medium. 8. Regional Indigenous enterprises which support the resources sector are available. **Responsible parties**: Regional Development Commissions, state government, local Indigenous communities, resource companies. **Priority:** Medium.

Issue	Strategies	Measure of success
Barriers to employment include: • CVs and on-line and written applications are barriers for most people in remote communities. • Security checks can be barriers to workforce entry. • Driving licence requirements can be barriers to workforce entry. • Cultural awareness needs to be addressed in the workplace. • Psychometric tests normalised to non-Aboriginal urban populations tell us nothing about the potential of Aboriginal candidates. • Individuals need real mainstream jobs and should not be confined to jobs deemed suitable for Aboriginal people. • Without a real job to go to, there is no point in training people.	1. Education initiatives, scholarships, pre-employment training, fitness-for-work programs, and programs directed at reducing the impact of alcohol and other drugs, loss of licences and prior criminal convictions. 2. Mining companies to be eligible for government funding for their Indigenous pre-employment training programs. 3. Increase the training and employment opportunities. This includes traineeships, apprenticeships, earthworks, clerical training. 4. Improve retention through support strategies to assist in retaining workers once employed. These include mentoring for Indigenous workers, provision of mentoring skills for supervisors, cross-cultural training across the workforce. 5. Training providers who cannot demonstrate a rate of at least a 25% employment outcome in their graduates should not be considered for further funding unless they can demonstrate that graduates have continued into further formal training. 6. Many labour market programs have proved effective in making Indigenous people work-ready and getting them into work. The manner in which they have been run has been crucial to their success, namely: • the use of Indigenous service providers to provide mentoring and employment support; • the restructuring of the courses into shorter courses with participants all being Indigenous; • the provision of wage subsidies for employers who provide work experience and employment opportunities during the training of Indigenous employees until they are at the required skill level. 7. Evidence suggests that success has occurred where there has been a mix of on-the-job work experience, ongoing mentoring during training and employment, and wage subsidies or brokered placements.	1. Mine-site employee demographics represent the greater Australian population. **Responsible parties:** Enterprises, state and Commonwealth governments. **Priority:** Low.

ATTRACTION AND RETENTION

The resources sector has suffered from skills shortages rather than labour shortages due to their ability to pay wages that will draw employees from other industries. On the other hand, the drilling sector competes with mining, construction and defence for new entrants and does experience labour shortages.

Anecdotally, employee turnover in the minerals and energy sector is high. At some FIFO sites the turnover was as high as 30 per cent at the height of the last mining boom. The Australian Bureau of Statistics (ABS) reported that, as at February 2008, 12 per cent of mining workers had changed their employer in the previous 12 months. Unfortunately, data on the amount of labour 'churn', as compared to labour moving to other industries or out of the workforce, is very limited.

Workforce Diversity

The female participation rate in employment has been improving over the past ten years and in Western Australia is around 59 per cent, which is up from 48 per cent in 1984. The growth can be attributed to higher levels of education, greater social acceptance of working mothers, better access to childcare and more flexible working hours; however the participation rate is still below that of many OECD countries. There is a reported decline in the employment participation rate of women between the ages of 25-44 years, the age when many women have childcare responsibilities. Since there is no doubt that an increase in the participation rate for women with child-caring responsibilities can have a positive effect on the economy for Western Australia, there needs to be a concerted effort to support this not, only by governments but by business as well. FIFO, shift rosters and mine-site employment conditions often hinder certain religious groups from seeking employment. For example, communal change rooms, the lack of halal catering and seven days a week operations may prevent workers from meeting their religious obligations (prayer requirements, dietary requirements and the Sabbath).

Ageing Workforce

Because of the age profile of the current workforce (45 plus) and partly because of the churn within this and other industry sectors (construction, mining, oil and gas), the retirement and replacement (particularly of skilled professionals and senior management personnel) is an issue for companies. Many employers have concerns about the impact that the retirement of an ageing workforce will have in the next 5-10 years on the industry, at the specialist professional and trades levels. There is also a scarcity of professionals and technical staff with 10 years experience or more to take up key middle/senior management roles, as the older workforce enters retirement. As a result many employers have focused their attention away from strategies to resolve skills shortages to strategies aimed at increasing the retention of existing employees.

Apprentices

Many resource industry organisations find that the signing up and managing of the paperwork for apprentices difficult to 'navigate' and so they are reliant on Group Training Organisations to provide labour-hire apprentices.

During economic downturns operational sites often shed personnel. The decision to retain apprentices, despite a reduction in staffing in operational areas, presents employers with a number of potential operational issues and risks such as the provision of adequate supervision and on-the-job training.

Migrant Workers

Due to shortages in some of the professional occupations; 457 visas have been utilised for skilled migration. Issues for employers include the significant costs and resources involved in recruiting people from overseas. Due to these costs, there is a focus on higher level, high-skill occupations when undertaking skilled migration as a recruitment strategy. Key issues for skilled migration are retention, cultural differences, language, state licensing frameworks, relocation costs and skills quality. There are also difficulties with the recognition of overseas qualifications.

Regional and skilled migration schemes enable overseas workers to come to Australia as migrants on the understanding that they will live and work in a particular region in a specified occupation. These schemes are not as successful as they possibly could be, given that there is no actual follow-up that individuals are living in the location specified or in the occupation nominated. Therefore the schemes are not meeting the aim of addressing skill shortages in the regions.

Issue	Strategies	Measure of success
Women in mining Female participation rate in resource employment does not reflect the greater population	1. Employers could consider flexible working conditions such as flexible hours, time off in lieu, flexible rosters, aggregated hours, family/carer's leave, parental leave, job sharing and part-time work. 2. To encourage participation, governments could consider subsidising childcare for all income brackets or making childcare tax deductible. 3. Affordable 24/7 boarding facilities could be made available for children of all ages whose parents both wish to undertake FIFO employment. 4. Remove fringe benefit tax on employer-provided childcare centres. 5. The high effective taxation rate does not encourage females to return to paid work after having children.	1. The percentage of resources sector employees who are female has increased over current figures. **Responsible parties:** Enterprises; state and Commonwealth governments. **Priority:** Low. 2. Childcare is 100% tax deductible if both parents are working. **Responsible parties:** State and Commonwealth governments. **Priority:** High. 3. Affordable boarding facilities are available for the children of employees. **Responsible parties:** Enterprises; state and Commonwealth governments. **Priority:** Medium. 4. The taxation systems are modified to encourage both parents to engage in full time employment. **Responsible parties:** State and Commonwealth governments. **Priority:** High.
Religious inclusivity FIFO, shift rosters and mine-site employment conditions often hinder certain religious groups from seeking employment.	1. Employers to review workplace practices and facilities to ensure that religious obligations can be met.	1. Mine-site employee demographics represent the greater Australian population. **Responsible parties:** Enterprises. **Priority:** Low.
Ageing workforce Because of the age profile of the current workforce (45 plus) and partly the churn within this and other industry sectors (construction, mining, oil and gas), retirement and replacement (particularly of skilled professionals and senior management personnel) is a issue for companies.	1. Retention and succession planning is a priority issue, particularly regarding key operational management and professional personnel. Graduated (part-time) retirement, mentoring of younger professionals and consultancy opportunities may assist in keeping these people engaged within the organisation, or at least maintain access to their corporate and professional knowledge. 2. Succession planning through the provision of leadership training for key operational and management/professional personnel will become an increasingly important retention strategy. 3. An active strategy to attract and recruit more women into the industry at senior management, professional and trades levels is an ongoing priority.	1. Post-retirement-aged individuals are maintaining at least some contact with the organisation in a paid capacity. **Responsible parties:** industry. **Priority:** Low. 2. Succession planning and the training of younger professionals into the roles identified as at risk are implemented. **Responsible parties:** industry. **Priority:** Low. **3.** The proportion of females in management roles is increased. **Responsible parties:** industry. **Priority:** Medium.
Attractive industry to work in - superannuation With employment being affected by commodity process and the high turnover of employees, many mining workers never accumulate long service leave.	1. The establishment of a transferable long service leave provision like that of the construction industry would enable the years served in the industry to be recognised rather than the years served in a company.	An industry long service leave provision is available. **Responsible parties:** industry. **Priority:** Low.

Issue	Strategies	Measure of success
Employer sponsored migration Key issues for skilled migration are retention, cultural differences, language, state licensing frameworks, relocation costs and skills quality. There are also difficulties with the recognition of overseas qualifications.	1. Establishment of a one-stop shop for overseas qualifications equivalency processing and advice. 2. Companies importing skilled labour should have access to government-funded language testing services. 3. Companies could provide more realistic information on the locations and working conditions in which the worker and their family will be living including a true reflection of the soft and hard infrastructure and the distances between work and Perth.	1. A one-stop shop is established for employers and migrants to have overseas qualifications (trade and professional) mapped to local qualifications. **Responsible parties:** State and Commonwealth governments. **Priority:** High. 2. Companies have accurate and informative information on the working and living conditions attached to the employment offer. **Responsible parties:** Industry. **Priority:** Medium.
Skilled and regional migration There is no follow-up to ensure that a worker is living in the location specified or in the occupation nominated as the basis for migration.	1. Build in a requirement for a migrant to live in the nominated location and occupation for a specific time before they can either have their visa renewed or become a permanent resident. Include a time limit on the visa to enable a follow-up of compliance with the above.	1. Migrants who arrive on a regional migration visa live and are employed in that region for a period of four years before they can either have their visa extended or become a permanent resident. **Responsible parties:** State and Commonwealth governments. **Priority:** Medium. 2. Migrants who arrive on a skilled migration visa work in that occupation for a period of four years before they can either have their visa extended or become a permanent resident. **Responsible parties:** State and Commonwealth governments. **Priority:** Medium.
Apprentices Many resource industry organisations find signing up and managing the paperwork for apprentices difficult to "navigate" and cannot guarantee supervision rations during economic downturns.	2. Have the ApprentiCentre the one-stop shop for all apprentice issues including: • Promotion • Sign-up • Mentoring • Issues management (RTO, apprentice, employer) • Monitoring • Progress payment • Sign-off. 3. Enable apprenticeships to be suspended; then the apprentice would attend full-time off-the-job training while receiving a study allowance instead of wages, until such time as the economic situation improves and the company can recruit adequate tradespersons to supervise the apprentices.	3. Employers have access to concise information on the sign-up and ongoing process of engaging and maintaining an apprentice. **Responsible parties:** Department of Training and Workforce Development. **Priority:** High. 4. A one-stop shop is available for employers to access when considering taking on and providing ongoing employment for an apprentice. **Responsible parties:** State and Commonwealth governments. **Priority:** High. 5. Full-time training opportunities exist for redundant/suspended apprentices to

Issue	Strategies	Measure of success
		access. **Responsible parties:** State and Commonwealth governments. **Priority:** High.

TRAINING AND PRODUCTIVITY

Quality of Education and Training

Most employers who recruit university graduates (engineers/geoscientists) are satisfied with the quality of the graduates, but the number of graduates is not deemed sufficient for the industry's short and medium-term needs.

There are many training providers that liaise with industry to provide quality training programs and whose graduates are sought after by industry. However, employers often express concerns over the quality of VET delivery provided by the training providers who include little or no practical component to their training, or deliver training in unrealistically short timeframes. Governments could play a role in ensuring the quality of training providers, particularly in regard to the rigour of training delivery and assessment, the use of site standard equipment and appropriate job hazard analysis. Whilst the Australian Quality Training Framework (AQTF) provides a framework for auditing the systems and processes under which the RTOs operate, it has not yet delivered the quality improvements that would engender industry confidence in the VET product.

Much offsite training is scheduled around the training provider's operational and funding timelines rather than the requirements of industry. Weekly classes are still the norm, without consideration for the expense and effort required to release a remote employee to attend training. The content of training is also often training-provider-driven rather than industry driven.

With respect to vocational education and training, the most significant barrier to training is the availability of training delivery and training infrastructure that meet the operational needs and quality expectations of industry. A number of employers commented that VET institutions, particularly TAFE colleges, could benefit from:

- closer partnerships with industry;
- increasing their lecturing staff's expertise to gain specific industry knowledge;
- encouraging shared access to facilities and equipment;
- seeking more input from industry into training delivery, programs, standards and outcomes.

The poor levels of literacy and numeracy of many school leavers and job applicants, particularly for pre-vocational, apprenticeship and Indigenous programs, were raised as a significant issue which industry feels should be addressed by the education and training system, not employers.

With respect to VET in schools, SkillsDMC has developed the Certificate I and II Resource Industry Operations pathways for schools; the success of these programs will depend on training providers consulting with local resource operations to develop and deliver a responsive and appropriate program. On completion of the programs, students will need to have further training pathways available to ensure that they remain engaged in training until they reach the age of employment in the resources sector.

Employer Provided Training

Most large companies have a well-established graduate program aimed at new employees who are recent university graduates. These programs are typically one to three-year programs which expose the graduate to all the different functions/departments and the various operations/sites within the company. Graduate programs are usually well-structured professional development programs delivered in a supportive environment and designed to provide opportunities to work in a number of different roles and sometimes departments providing on-the-job training and mentoring with an emphasis on self-learning and development.

Resource companies also have a strong tradition in providing training to operational employees. This training typically occurs on the job, utilising peers to train new employees in safe systems of work. Workplace assessment of competency is normal practice for the industry, with new employees being required to demonstrate equipment operation competency and safe task completion before being able to work without direct supervision.

The in-house training is provided to the operator and technician-level employees as there has been inadequate pre-employment training available that will equip recruits to be work ready. There is a preference for on-the-job training as training and assessment are directly linked to the equipment being utilised by the individual and to the company's standards.

Employers are more interested in employees gaining skills sets that relate to current or future job roles rather than whole qualifications of which many competencies will not be utilised in current or future roles. The funding model currently supports qualifications rather than skill sets.

Pre-employment Information and Training

Government initiatives are needed to promote communication and partnerships between resource employers and job service providers to enhance job service providers' information provision and to ensure that job-seeker eligibility for employment is evaluated prior to any training occurring. There is a need to develop initiatives to improve career advice for job seekers and greater awareness of entry requirements and career pathways in the resources sector.

There is a lack of an industry recognised pre-employment training program. The Certificate I and II Resource Industry Operations qualifications have the potential to be developed into pre-employment programs and to provide a pathway to either employment or adult apprenticeships and traineeships. Programs currently being delivered lack consistency in quality or workplace-relevant competency outcomes. Any program will need to incorporate literacy and numeracy development, along with training delivery utilising site-standard equipment, typical work site procedures and it should incorporate appropriate job-hazard analysis.

Funding Available for Training

A concern expressed by many companies was the difficulty of navigating their way through the state and Commonwealth agencies and bodies involved in promoting, supporting, funding and managing the vast array of training and employment programs and initiatives. Smaller companies are wary of the time and costs they would need to expend on applications, approvals and reporting if they were to utilise any of these programs.

Companies expressed concerns that:

- Most funding programs were supply (rather than industry demand) driven;
- The funding programs often lacked the flexibility to be customised for the specific business needs of the employers;
- Many training providers accessing the public-funding sources were predominantly focused on training rather than workplace competency as an outcome.

Employers are becoming more aware of traineeships and public funding that is available for existing and new workers through the Productivity Placement Program (PPP). For the PPP to be successful, training providers will need to become more flexible and responsive to industry needs and this will lead to an increased confidence in the VET sector. There is an expected growth in demand for publicly-funded training by the resources industries.

Many of the companies who access government-funded programs (EBPPP and employer-driven PPP) to support their workforce development/education and training needs were positive about working in a partnership with training providers, but only if their strategic and operational business needs were able to be met. The same level of support is not shown for training-provider-driven PPP and other programs where the training provider obtains the funding without having to demonstrate that they have engaged companies and students to undertake the training. An issue with provider-driven training is that the training is usually off-the-shelf training which is not customised for industry or workplace needs.

To meet existing workforce skills needs, a number of companies stated that a simplified application process which placed the funding with the companies (as the purchaser of training) would give the companies more control over the quality and content of what the training providers deliver.

Adopting a partnership approach between companies and the government funding agency to address their strategic needs 'across the business' would be more effective than applying for support on a one-off program basis. Also companies have often commented on not knowing what funding and programs are available for existing and new workers. With multiple agencies providing funding for different programs, employers are confused about who to approach and when to apply for funding. A partnership approach, which reduces the need to engage with numerous government agencies for funding, collaborative projects and programs, i.e. a 'one-stop shop', was seen by many employers as a positive way to develop these relationships.

Western Australia needs to ensure that funding rates for regional, remote and workplace VET delivery reflect the real cost of delivery, especially for higher cost, technology-intensive trades programs.

Regional Training Infrastructure and Opportunities

In relation to retention and training of employees, employers are responsible for internal policy relating to skills development and existing worker training. However, there remains a role for governments and the community in ensuring that the supporting hard and soft infrastructure is in place to provide training as well as the community facilities and amenities that encourage workers to remain in their current location.

Regional and remote communities deserve the same access to education and training as their metropolitan counterparts. While there are thin student markets within the regions, these individuals, if trained, can provide ongoing valuable local labour and skills to support the resources industry. It is important that regional education and training providers are supported through more responsive regional loading when it comes to funding.

There is a need in remote and regional areas for improvements in the availability of childcare as well as training opportunities to enhance women's opportunities to gain skills and take up employment with local resource operations.

With most resource operations being located in the regional areas, access to remote and regional training is an issue. Employers cannot afford the time or expense in flying employees to metropolitan locations for training and so regional and workplace training is preferred. But with thin markets many training providers are not willing to service the remote regions and there is often a compromise between quality and cost of delivery. Funding rates for regional, remote and workplace VET delivery need to reflect the real cost of delivery, especially for higher cost, technology-intensive trades programs.

Publicly-funded training in the remote and regional areas is predominantly supplied by the local TAFE and institutes; however metropolitan institutes and RTOs also service the regions to a lesser extent. Resource companies use publicly-funded training to train their apprentices, but many are not enrolled at the local TAFE as there are issues with the quality of service being provided. Resources companies recognise that local TAFEs are essential in providing services to:

- contractors that support the sector;
- local companies;
- workers' partners who are caring for children;
- local communities, to build the capacity of individuals to work within the sector.

The issue is that if the local provider does not have the resources (human and equipment), organisations will source the training elsewhere. This leads to low student numbers which affects funding. Funding in turn affects the services that can be provided, which leads local businesses to continue or increase sourcing training outside the local area. The impact of this is increased costs for the large businesses through travel and accommodation costs (either flying trainers to site or trainees off site to the provider) and reduces the number and quality of services provided to local contractors and the communities.

Other major issues affect publicly-funded training in remote and regional areas:

- The attraction and retention of quality lecturing staff.
- Due to comparatively low student numbers compared to metropolitan providers, there is inadequate demand to justify capital and equipment upgrades, administration staff and IT infrastructure and support, especially in the smaller centres (e.g. Tom Price, Pannawonica) and Aboriginal communities.
- Funding is predominantly based on student contact hours. If there is an inadequate number of students, there will not be enough funding to sustain programs. This is exacerbated in Aboriginal communities.
- Funding is aligned with the delivery of nationally recognised training programs with set criteria (especially the time required to deliver). This model does not allow for flexibility of programs and the creativity to address specific community requirements (e.g. longer duration work-ready programs for Aboriginal communities).

Issue	Strategies	Measure of success
Publicly-funded training Identifying and accessing government funding for training new and existing workers is not transparent and readily available.	1. To adequately resource and deliver the skills required by the resources industry, realign government funding programs to enable employers, as purchasers, to directly manage the programs and choose the providers, services and outcomes required. This would ensure that the funding and resources required to support and deliver an industry demand-driven, workforce development model meet the current and future workforce needs of the resources industry 2. To deliver more flexible workforce development and skills programs, the government could shift the focus to a purchaser-oriented, demand-driven system rather than a supplier-driven system. A system is needed that enables employers to implement programs which meet their strategic business needs. These needs include particularly those related to retention, highly skilled-high demand occupations, apprentices, regional and Indigenous employment, attracting more women into the workforce and responding to the retirement/ageing workforce issues. 3. The Department of Training and Workforce Development could develop a brief and concise publication for employers which explains where funding can be obtained and the process and the timeframes for submissions. This should be available on the Department's website.	1. A process for accessing public funding for training is readily available and the process for obtaining funding is straightforward and transparent. **Responsible parties:** Department of Training and Workforce Development. **Priority:** High. 2. Dates for applying for publicly-funded training are published on the Department of Training and Workforce Development website well in advance (12 months) of the call for applications. **Responsible parties:** Department of Training and Workforce Development. **Priority:** High. 3. Public funding is more demand-(employer) driven rather than supplier-(RTO) driven. **Responsible parties:** Department of Training and Workforce Development. **Priority:** Medium.
Foundation skills Barriers to employment in the minerals and energy sector for many unemployed and underemployed people include lack of foundation language, literacy and numeracy skills, lack of communication skills, teamwork skills, problem-solving skills, planning skills and self-management skills.	1. There is a need for government to focus on expanding programs in both regional and metropolitan Western Australia to improve the language, literacy, numeracy and work-readiness skills of the disengaged. 2. Upgrade remote campus facilities and equipment to assist with implementation of multiple business-focused work-ready programs. Local employers can then utilise the facilities and co-fund the delivery of appropriate pre-employment training to local groups. 3. Increase funding amount together with modification of the funding model to allow for long-term (possibly non-accredited) programs, support and implementation of work-ready programs for Aboriginal communities.	1. Higher levels of literacy and numeracy are being reported by employers. **Responsible parties:** Department of Training and Workforce Development; Job Service Providers. **Priority:** High.
Funding for training regional workers Regional residents are a good source of stable employees but there are few opportunities for them to undertake publicly-funded local pre-employment training.	1. The Training Councils to promote to the industry the public funding available for existing workers. 2. The PPP new worker funding should be extended to employees who have been in the **job role** for 12 months or less and could cover AQF Certificate II, III and IV. 3. The PPP existing worker funding should be extended to AQF levels II and III. 4.	1. More companies are taking up the offer of publicly-funded training. **Responsible parties:** WA Training Councils, state government. **Priority:** Medium.
Pre-employment training There is a lack of an industry-recognised pre-employment training program. The Certificate I and II Resource Industry Operations	1. The state government, through the RITC, needs to support and facilitate the development and implementation of an industry-endorsed entry-level qualification for the minerals sector, with clear	1. The Western Australian mining industry endorses and supports a Western Australian mining pre-employment

Issue	Strategies	Measure of success
qualifications have the potential to be developed into pre-employment programs and to provide a pathway to either employment or adult apprenticeships and traineeships.	identification of employability attributes. Consultation between major employers needs to occur with the aim of determining the outcomes required of such a training program and endorse its delivery and consider graduates for employment. The entry requirements of the program need to reflect the employment requirements of the resources industry. That is, entry into the course could depend on a graduate's capacity in meeting the fitness for work, age and literacy standards or at least the applicant must demonstrate a commitment to meet those requirements.	program. **Responsible parties:** Industry, RITC, state government. **Priority:** Medium.
Remote training opportunities Regional and remote communities deserve the same access to education and training as their metropolitan counterparts.	1. Regional RTOs could be encouraged through additional funding to provide pre-employment programs that meet the needs of their local industry and community. These programs need to be developed in consultation with local employers to ensure the appropriateness of the training and the skills required of graduates. The additional funding could be linked to an annual review of graduate destinations. 2. Subsidised childcare and after school care need to be made available for parents undertaking training with the aim of moving into employment. 3. The state government to fund the development of information brochures for distribution through the job service network and the high-school career adviser network. These brochures are to detail in plain English the employment requirements of the industry, the local training available and the skills that can be acquired in an allied industry. The state government to provide support and funding for innovative and flexible programs aimed at addressing specific issues outlined in this document. These include literacy and numeracy, Indigenous and regional training initiatives, apprenticeships, undergraduate/postgraduate programs and flexible delivery, particularly for regionally-based students and employers.	1. Relevant and industry-supported pre-employment training programs are available in each of the major Western Australian mining towns. **Responsible parties:** Industry, state government **Priority:** Medium. 2. Affordable childcare and after school care enable parents to attend training. **Responsible parties:** Industry, state and Commonwealth governments. **Priority:** High. 3. Accurate information on employment requirements and pre-employment training is available through the job service network and the school career adviser network. **Responsible parties:** Industry, state governments. **Priority:** High. 4. Soft and hard infrastructure and funding is available to address the need for flexible programs aimed at addressing the needs of regional Indigenous populations. **Responsible parties:** Industry, state government. **Priority:** Medium.
Regional training delivery With thin markets, many training providers are not willing to service the remote regions and there is often a compromise between quality and cost of delivery.	1. Funding needs to be adjusted to meet the additional costs of delivering training in remote workplaces. 2. State government (WestOne) and employer partnering is required to develop workplace-relevant training materials. 3. Resource companies could consider co-funding capital equipment that is	1. Funding for delivering training in remote and regional workplaces is adjusted to take into account the additional costs associated with travel, accommodation and thin markets.

Issue	Strategies	Measure of success
	utilised for training delivery relating to the sector. 4. Increase the number of 4WD vehicles at regional and remote TAFEs and institutes to allow flexibility in the movement of lecturers between campuses, remote communities and access to mine sites. 5. Facilities and equipment to be upgraded to the equivalent standard of the metropolitan TAFEs and institutes. The focus is to be on both trade and post-trade programs, industrial skills training and Aboriginal work-ready programs.	**Responsible parties:** Industry, state and Commonwealth governments. **Priority:** Medium. 2. Regional TAFE lecturers and training equipment are of a standard acceptable to industry. **Responsible parties:** Industry, state and Commonwealth Governments. **Priority:** High.
Skill sets versus qualifications Employers are more interested in employees gaining skill sets that relate to current or next job roles rather than a full qualification of which many competencies will not be utilised in current or future roles. The funding model currently supports qualifications, not skill sets.	1. The funding model for the VET sector could be reviewed to enable funding to deliver industry-relevant skill sets in addition to funding full qualifications.	1. More industry employees are completing skill sets. **Responsible parties:** State and Commonwealth governments. **Priority:** Medium. 2. Public VET sector funds skill sets. **Responsible parties:** State and Commonwealth governments. **Priority:** Medium.
Quality of training Industry often expresses concerns over the quality of VET delivery.	1. A role to monitor Western Australian VET Provider Quality Outcomes could be established. This independent body could utilise employer feedback to determine and report on which training providers are delivering quality outcomes and meeting the needs of industry. These reports would provide input into the ongoing allocation of public funding to training providers.	1. Employers can easily access information on their industry's levels of satisfaction of training providers. **Responsible parties:** State Government. **Priority:** Medium.
Competent graduates The major barrier to effective institutionalised education and training in the resources sector is the need for education and training to provide industry-competent graduates. Education and training infrastructure needs to mirror current industry usage and training delivery needs to be delivered with a stronger safety focus, more realistic employment conditions and within processes that are utilised by industry. Training needs to be conducted by trainers with current industry competencies and under typical industry conditions (workplace policies and procedures).	1. Government and the minerals sector need to be partners in establishing further centres of excellence in training for the resources sector utilising the established model of ACEPT which is overseen by an industry management team to ensure the quality of training delivery, trainer skills and infrastructure which meets the needs of industry. 2. Establish a government and industry joint-venture Mining and Resource Processing Training Centre of Excellence. Mining pre-employment programs which include theory along with work experience could be delivered. Minerals-processing techniques could be delivered utilising a number of working-model process plants. These would include the major processing techniques used in Western Australia. Lecturers and trainers could have current industry skills and delivery could be on current industry technology and under industry working conditions. 3. Resource companies could consider placing older employees within the VET sector. These employees may not be fit for work due to their age but would make excellent trainers or mentors. Companies could retain these employees but place them within the local TAFE college to provide mentoring to other lecturers and support training.	1. A Minerals Processing Centre of Excellence is established in the Pilbara, Mid-west and in the Perth metropolitan regions. **Responsible parties**: State and Commonwealth governments and industry. **Priority:** Medium. 2. TAFE colleges have access to industry-competent technical trainers. **Responsible parties**: DTWD and industry. **Priority:** High.

PLANNING AND COORDINATION

There is a preference for employing local residents as they often provide a more stable workforce than FIFO employees. But attracting people to the remote and regional communities has not been without issues.

Mining-dominated towns can be broken into a number of community groups.

- The local Indigenous community.
- Resource sector employees, mainly Woodside, Rio Tinto and Pilbara Iron employees. This group is, relative to other sectors, highly paid, with good access to housing.
- The FIFO community, mainly mining and construction company employees who either do not wish to relocate to regional Western Australia or do not have subsidised housing provided. These employees do not tend to spend money in the community, nor do they financially support local facilities (service or recreational).
- A community of 'others', including small businesses, service providers and government employees. This group faces challenges in high labour, housing and living costs. Unable to match the salaries of the resources sector, this group often loses staff to mining. Housing standards and housing availability for public sector employees contributes to a high turnover of doctors, teachers and nurses. Pilbara shires have experienced periods in which up to 30 per cent of local government positions were vacant.

In the Pilbara the non-Indigenous group can also be loosely described according to the goals of individuals. Colloquially, there are 'two, five and 10-20-year people'[35]. Two-year people generally only stay for one summer and two winters before leaving the region; five-year people typically have a savings goal and leave the region once they have achieved it; 10-20-year people stay either for financial reasons or because they like the way of life.

Interviews[36] show that the majority of Pilbara residents intend living there for a defined period and do not intend to put down roots. For this reason, the majority of savings and investment (including residential housing) is done outside the region. Housing investment in the region is affected by the dominance of company housing and the boom-bust cycles that affect residential housing prices. The emergence of FIFO workforces further compounds the issue.

FIFO options have given employees flexibility to commute to work and live in Perth. A lack of community and sense of belonging can result from transient and FIFO populations. Resulting perceptions about Pilbara towns include a lack of community leadership blended with social apathy and a sense of isolation.

There are perceptions of increasing crime rates; levels of domestic violence are almost three times the state average, and the suicide rate among males aged 18 to 25 is much higher than state norms. There is a level of frustration about the cost of living (overall, prices for goods in the Pilbara are 11.3 per cent higher than in Perth). Median housing prices are far higher than the state average, and there is a lack of choice and availability in services such as day-care and medical facilities.

Relocating to regional Western Australia is not seen as an attractive or viable option due to a combination of issues including but not limited to:

- Cost of relocation;
- High cost of housing and accommodation;
- Quality of affordable accommodation and housing;
- High cost of living (fuel, water, power, food, transport);
- Isolation from family and family support;
- Lack of infrastructure including 24/7 affordable childcare, quality schools, university access, libraries, cultural activities;
- Perceived levels of crime;
- Social apathy;
- Lack of sense of community;
- Climate;

35 Rio Tinto: *Understanding the Pilbara Region and its Economy*
36 Rio Tinto: *Understanding the Pilbara Region and its Economy*

- High levels of boredom for non-working residents (partners).

Issue	Strategies	Measure of success
Regional residential employment Relocating to regional Western Australia for employment is not seen as an attractive or viable option.	1. State and Commonwealth governments can play a part in minimising the costs of relocation by introducing tax and financial incentives for families to relocate to the regional areas where employment opportunities exist. 2. The regional tax allowances need to be reviewed to more accurately reflect the additional costs of living in regional Western Australia. 3. The state and Commonwealth governments could implement an Infrastructure program to provide affordable water, affordable electricity, adequate transportation, and access to quality hospitals, libraries, schools and university campuses in the regional areas to help attract people. 4. The state government could develop and fund public awareness campaigns to be delivered to the eastern states with the aim of raising awareness of the lifestyle, job and career opportunities in the regional areas of Western Australia. 5. The Commonwealth government could consider taxation incentives to offset the additional costs of living in the regional areas of WA. 6. Both state and Commonwealth governments could consider the release of affordable land in the regional areas with tax incentives to offset the additional cost of construction. 7. Governments could consider tax-deductible interest on home loans for owner-occupied regional housing. 8. Local governments could consider the building of large-scale caravan parks and other temporary accommodation for families who are willing to relocate and live in either their own or rented caravans. 9. The government could consider tax-deductible boarding school fees for regional families. 10. The state and Commonwealth governments could support the development of affordable 27/4 childcare facilities and recreational facilities to support shift workers. They could consider making 100% of the costs of childcare tax deductible if both parents are in full-time employment. 11. Mining companies could consider reintroducing the home purchasing scheme available in the 1980s whereby employees who work for a company for 15 or more years had the right to purchase or sell the company house in which they had lived at a price set at the date of occupancy. 12. Local, state and Commonwealth governments could look at ways of encouraging companies to support residential employment and make FIFO accommodation less attractive.	1. Karratha, Port Hedland and Newman become attractive, thriving townships with viable populations, along with the necessary soft and hard infrastructure representative of the Perth metropolitan area. **Responsible parties:** State and Commonwealth governments. **Priority:** High. 2. A range of affordable permanent (housing) and semi-permanent (caravan park) accommodation is available. **Responsible parties:** Industry, local, state and Commonwealth governments. More industry employees are completing skill sets. **Responsible parties:** State and Commonwealth governments. **Priority:** High. 3. Affordable 24/7 childcare is available to families in which both parents work. **Responsible parties:** Local, state and Commonwealth governments. More industry employees are completing skill sets. **Responsible parties:** State and Commonwealth governments. **Priority:** High.

The Way Forward

This industry workforce development plan should be considered along with the information and recommendations in other industry development plans, the regional development plans and the State Workforce Development Plan.

Given the limited scope of influence of the Western Australian training councils, this workforce development plan is provided to the Department of Training and Workforce Development and interested persons for consideration.

- The information and strategies provided that require government action and funding which are considered worthy of actioning will need to be driven by the Department of Training and Workforce Development using its influence in the Western Australian public sector.
- Industry associations may like to consider their role in addressing the industry-level strategies.
- Employers may also find value in considering the strategies and evaluating them for possible effectiveness within their organisation.
- Training providers could consider if the training strategies suggested are viable for them and their clients and consider trialling the recommended strategies to determine the appropriateness and cost effectiveness of the recommendations.

BIndustry Area Coverage

GROUP	CLASS	DESCRIPTION
B	1101	Black coal mining
B	1102	Brown coal mining
B	1311	Iron ore mining
B	1312	Bauxite mining
B	1313	Copper ore mining
B	1314	Gold ore mining
B	1315	Mineral sand mining
B	1316	Nickel ore mining
B	1317	Silver-lead-zinc ore mining
B	1319	Metal ore mining n.e.c. *
B	1411	Gravel and sand quarrying
B	1419	Construction material mining n.e.c. *
B	1420	Mining n.e.c. *
B	1520	Other mining services

* n.e.c. - not elsewhere classified in the Australian New Zealand Standard Industrial Classification Group