



Australian Government

RESOURCING THE FUTURE

National Resources Sector Employment Taskforce Report

July 2010



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Parliamentary Secretary
for Western and Northern Australia

The Hon Martin Ferguson AM MP
Minister for Resources and Energy

Senator the Hon Mark Arbib
Minister for Employment Participation

Parliament House
CANBERRA ACT 2600

5 July 2010

Dear Ministers

On 1 September 2009 the Australian Government announced the establishment of the National Resources Sector Employment Taskforce to help secure the skilled workforce required to build and operate major resources sector projects over the next five years.

As Chair of the Taskforce, I am pleased to present the final report.

In establishing the Taskforce, the Australian Government signalled its commitment to ensuring that the expansion of the resources sector is efficient and supports job opportunities across the whole economy while avoiding the worst impacts of skills shortages.

The Taskforce consulted widely in preparing the report. Following the release in March 2010 of the Taskforce discussion paper, *Resourcing the Future*, Taskforce members and I spoke with hundreds of resources sector companies, industry associations, regulators, state and territory government officials, unions, training providers, universities and Members of Parliament. We received almost 100 formal submissions in response to the discussion paper.

The Australian resources sector can justifiably take pride in its achievements—from the first exports of lead concentrate from Broken Hill to China via Port Pirie in 1891, to the vibrant and strong resources economy we have today. It is an industry that in recent years has made considerable productivity growth. The challenge for the 21st century is to continue this growth through advancements in technology and development of a highly skilled and internationally competitive workforce.

The resources sector has defined our national identity, prosperity and regional significance. Australian resources have created great global corporations, led to global technological leadership and supported Australian communities and families.

Although a small proportion of national employment, the resources sector is a powerful driver of our national wealth and has a major impact on employment and opportunity in regional Australia and in support industries across the country.

Confidence in the resources sector is strong. New job vacancy figures released by the Australian Bureau of Statistics on 30 June 2010 show the mining industry needed a record 6,200 new workers nationally in May 2010; far more than at any time during the mining boom of the previous decade.

The National Resources Sector Employment Taskforce Final Report seeks to provide recommendations for governments, the resources sector and stakeholders to address critical skills needs and plan for future growth. I note that a number of the recommendations could be supported by the Critical Skills Investment Fund, announced in the 2010–11 Federal Budget.

I would like to express my gratitude to the members of the Taskforce, members of the Skills and Industry Reference Groups, my Deputy Chair Senator Glenn Sterle from Western Australia, and in particular, the Taskforce secretariat, headed by Nicky Govan at the Department of Education, Employment and Workplace Relations. The hard work and knowledge that Nicky and her team have brought to bear on this project have not only made my task easier but have ensured a high-quality piece of work in a short amount of time.

I trust that the report meets with your satisfaction as a comprehensive response to the Terms of Reference.

Yours sincerely



The Hon Gary Gray AO MP
Chair
National Resources Sector Employment Taskforce
Parliamentary Secretary for Western and Northern Australia

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Executive summary

The resources sector contributes 39 per cent of Australia's exports (ABS 2010a) and 8 per cent of our gross domestic product (GDP) (ABS 2010b). Around 184,500¹ people are directly employed in mining and oil and gas operations, about 1.6 per cent of the Australian workforce. Although a small proportion of the total workforce, resources sector employment is vital to our national prosperity and has a major impact on employment in regional Australia and in support industries across the whole economy.

In addition, the resources economy is indirectly supported by:

- The engineering and construction sectors—whose workers undertake the construction of mining infrastructure, including desalination plants, power generation, crushers, conveyors, constructors, roads, ports and rail. Construction is usually short term, often done on a fly-in fly-out (FIFO) or drive-in drive-out (DIDO) basis by workers from every state and territory in Australia.
- The service sector—whose employees support mining and construction camps, including cooks, cleaners, bus drivers and service workers.

Each additional job in the resources sector may lead to a further one to three jobs in other industries, with the employment effect tending to be higher in regional centres where the resources sector is a major employer and there are readily available job seekers.

In the past, resources activity has been typified by boom and bust cycles. Between 2004 and 2008, for instance, a major resources boom in Western Australia produced significant labour shortages across the trades and in a range of sectors, including hospitality, in Perth and regional areas as workers left for the high pay on offer on resources projects. The global financial crisis led the resources sector to reduce its workforce by around 28,300 between November 2008 and May 2009 as operations and aspirations were wound back. By May 2010, employment had almost returned to November 2008 levels (ABS 2010c). Anecdotally, the Taskforce understands construction employment on resources projects declined over the same period and has now recovered.

Noting the need to improve the efficiency of the sector's labour market and address any negative impact on the rest of the labour market, the Australian Government announced the establishment of the National Resources Sector Employment Taskforce (NRSET) on 1 September 2009. The Taskforce first met in November 2009. Its terms of reference are set out in Appendix I. An industry reference group and skills reference group were also established to provide advice to the Taskforce and the Chair, the Hon Gary Gray AO MP, Parliamentary Secretary for Western and Northern Australia. Members of the Taskforce and the reference groups are identified at Appendix II.

The initial impetus for the Taskforce was the decision to sanction the Gorgon Liquefied Natural Gas (LNG) Project, which is now underway. Gorgon is likely to create up to 3,500 direct jobs during peak construction and up to 6,500 indirect jobs (see Appendix III). In the operational phase, Gorgon will support 500 operational jobs on LNG trains² and in administration.

¹ In May 2010, ABS data indicated employment in mining and oil and gas was 184,500 which included all those employed in mining (179,400—mining includes the oil and gas extraction subdivision) and all those employed in petroleum and coal product manufacturing (5,100—a subdivision of manufacturing).

² A train is a gas liquefaction and purification facility.

The Gorgon project is just one of a number of new or expansion projects underway or in the pipeline, particularly in Western Australia and Queensland. Clearly, skilled labour pressures in the sector are likely to increase if steps are not taken to address them.

The Taskforce's major responsibilities were to:

- examine the scope and timing of major projects, analyse the expected demand for labour and consider supply issues—these are found in Part A of the report
- develop a plan to address labour and skills shortages in the sector—this is found in Part B.

The Taskforce released a discussion paper on 1 March 2010 and received 97 submissions. It held public consultations in all mainland capital cities, Karratha, Gladstone, Cairns and Mackay between March 2010 and April 2010. The Chair and secretariat also met with a range of resources companies and other interested parties between December 2009 and May 2010.

It may be argued the skills needs of the sector are best left to the forces of supply and demand, supplemented by temporary migration to cope with demand spikes. The Taskforce respects the allocative efficiency of the market and notes the higher wages that result for workers in high demand are welcomed by many. However, resources sector labour shortages can quickly become regional, state, and then nationwide skills shortages. The Taskforce believes the growth in demand for Australian resources will transform the resources economy. With the right policies and planning the current boom can be the catalyst for long-term strengthening of the Australian economy, raising productivity and reducing social problems like unemployment and welfare dependency, which are ultimately linked to a lack of work-ready skills.

The right approach to the sector's skill needs must be demand driven and include improving our schools, developing our apprenticeship system, strengthening our universities and creating a more efficient labour market. It can also help address the unemployment and social disadvantage that persist in some segments of the community, most notably among Indigenous Australians. Effective strategies could also go some way towards addressing the average income differences between male and female workers and between metropolitan and regional areas.

The Taskforce understands the resources economy will always attract workers from other sectors. Better planning and appropriate training ensures those sectors can replace workers quickly with people who are not currently in the workforce.

Analysis of demand and supply

The workforce needs of the resources sector are significant and can be simply understood.

The major resources projects underway, or likely to be sanctioned before the end of 2015, will create numerous jobs but have different requirements in the construction and operational phases. Taskforce analysis shows:

- Construction jobs on new projects could peak at 45,000 in 2012 and 2013.
- Employment growth in mining operations is expected to be 4.9 per cent per annum over the next five years, creating around 61,500 new jobs by 2015 due to increased production, driven by demand from Asia.
- In LNG operations, pending the number of LNG trains constructed by 2015,

employment could increase by around 3,200 (e.g. if four new trains are sanctioned and operating in Queensland and six in Western Australia).

In addition, further vacancies will occur in mining and gas operations as around 10 per cent of employees leave the sector each year through retirement or transition to other sectors.

There are emerging shortages at present—mainly engineers and other professional staff with more than five years experience. The domestic supply of mining engineers and geoscientists will not be sufficient to meet demand over the next five years with a shortfall of around 1,700 and 3,000 respectively. However, there are large numbers of people with these qualifications currently working in other occupations.

While there are currently significant numbers of unemployed tradespeople, the Taskforce expects labour market tightening will result in skills shortages by late 2011 to early 2012, particularly in Western Australia and some regions of Queensland. As a result, the resources sector could be 36,000 tradespeople short by 2015. If these workers are recruited from other sectors there will be skills shortages in those industries.

What the Taskforce was told

The Taskforce was told of a strong need for better workforce planning to enable regions and states to better connect, prepare, train and house workers. Australia will need more skilled tradespeople, engineers and geoscientists in the future, and improvements in apprenticeship and engineering education will be needed. While regional planning is important to meet the sector's workforce needs, it cannot be undertaken in isolation. The sector's potential workforce is mobile, and employees travel long distances on a FIFO/DIDO basis to take up new opportunities.

Although some companies have a strong commitment to apprentice training, the resources sector as a whole does not train enough apprentices. There is reluctance by many employers to hire young people. Companies prefer to attract mature workers in their mid twenties and older with life and work experience. An option for the sector is to employ adult apprentices (a number of companies already do) or enter into partnerships with other organisations to train, or partly train, on their behalf.

The FIFO/DIDO workforce is important for resources projects, particularly in the construction phase but also in ongoing operations. There are currently unemployed tradespeople and labourers in every state. Flights are now operating from Melbourne, Sydney and Brisbane to many regional mining centres.

Submissions and consultations also suggested skills shortages could be alleviated if project proponents sequenced their labour requirements to optimise access to labour and accommodation. Offsite fabrication should also be used to reduce onsite demand for labour, and temporary migration is important to address temporary skills shortages.

While many more Australians would like to work in the sector, pathways to entry-level jobs are not always apparent.

One of the major concerns raised in submissions and consultations was the effect of housing shortages and soaring accommodation costs in population centres near resources projects, which affects the willingness and financial capacity of people from many work disciplines to relocate.

As a result of its deliberations, the Taskforce makes the following recommendations.

1. Recommendations

1. A new partnership approach

Workforce planning

1.1 That resources companies be required to provide a workforce impact statement using a standard template to outline the workforce needs of projects (\$40 million+) at the same time as they apply to the relevant state or territory government for project approval. Companies should then provide the relevant state or territory government with more detailed workforce information at the time of the Final Investment Decision, prior to the construction of the project and before project commences operations. This information should include proposed sources of labour and training plans. This approach should be trialled in Queensland, Western Australia and one other state with a view to being implemented nationally from 1 January 2012. This is recommended as an information requirement, not a further approval requirement.

1.2 That regional development organisations lead the development of regional workforce plans that include strategies to manage the impacts of major resources projects on the community and maximise opportunities for local people. Resources companies, education and employment service organisations, relevant local, state and Australian Government departments could be consulted in the development of such plans. A 'region' should be as defined by the state or territory government.

1.3 That Skills Australia report annually through the Ministerial Council for Tertiary Education and Employment to the Ministerial Council for Mineral and Petroleum Resources and the Ministerial Council on Energy on the status of skills shortages in the resources sector.

Workforce development

1.4 That resources and construction companies place a very high priority on training as a means of addressing their current and future skills needs and consider adopting a training culture similar to their approach to safety.

Single point of contact within state or territory government

1.5 That state and territory governments consider adopting a case management approach, such as that provided in South Australia, which involves the appointment of a senior, experienced government employee to provide companies with a single point of contact for all of their government approvals and regulatory requirements, including workforce planning.

2. Increase the number of trade professionals

2.1 That the resources sector significantly increase the number of apprentices it employs. The sector currently employs considerably fewer apprentices than would be expected given its share of trade employment.

2.2 That the Australian Government work with industry, unions, training providers, state and territory governments, industry skills councils, state skills bodies and industry associations to

trial alternative apprenticeship models with a view to increasing the number of trade-qualified people in occupations and locations where a shortage is expected (e.g. electricians and welders). These could include any or all of the following:

- accelerated, competency-based training with greater industry investment in workplace supervision and mentoring
- improved induction to apprenticeships through stronger pre-apprenticeships, including partnerships with Trade Training Centres
- the use of onsite and mobile training centres at mining sites
- companies entering into a commercial arrangement with other companies to train apprentices on their behalf
- apprentices commencing under group training organisation arrangements and transferring to a permanent employer in the resources or construction sector part way through their training.

2.3 That a program be developed in the Gladstone region as part of a coordinated workforce development strategy to boost the number of apprentices, including in electrical trades that will be in high demand in the liquefied natural gas, coal seam gas and construction industries. If successful, this approach could be replicated in other appropriate regions.

2.4 That relevant industry skills councils work with industry, education and training providers and unions to develop a model to assist people in the construction and resources sectors to achieve full trade status through better access to recognition of prior learning and recognition of current competencies and gap training (where required).

2.5 That industry place a priority on upskilling existing workers in the construction and resources sectors. As a first step, the Australian Government should provide seed funding to relevant industry skills councils to develop workplace learning capacities on major projects.

2.6 That employment services providers work with unemployed tradespeople and technicians to gauge their interest in working in the resources or construction sectors, assess their skills and aptitude for employment in these sectors in conjunction with industry and facilitate any upskilling required to link them to a job.

2.7 That construction workers with significant experience but without trade qualifications who lose their jobs be provided with recognition of prior learning and recognition of current competencies assessments, training needs analysis and gap training to assist them to achieve full trade status or an adult apprenticeship.

2.8 That the Australian Government and state and territory governments work with industry and education and training providers to broker tradespeople with an interest and aptitude for training, assessing, mentoring and supervising into Certificate Level IV or Diploma in Training and Assessment, or other relevant vocational education and training qualifications.

3. Graduate more engineers and geoscientists

3.1 That universities with a teaching profile that delivers professionals to the resources and construction sectors formalise and strengthen their ties with each other and industry, and articulate their role and strategic intentions in their mission statements.

3.2 That the Australian Council of Engineering Deans work with the Minerals Council of Australia, the Australian Petroleum Production & Exploration Association, and the Australian

Constructors Association (taking into account work being done by the Australian National Engineering Taskforce) to encourage their members to provide structured, work-integrated learning opportunities, such as internships and mentors, for all first and second-year engineering students.

4. Meet temporary skills shortages with temporary migration

4.1 That the Department of Immigration and Citizenship improves the information and support available for employers wishing to use the Subclass 457 visa program and agrees to finalise applications within five working days of a complete application being lodged with the department.

4.2 That the Australian Government introduce and promote the appropriate use of Enterprise Migration Agreements for 'mega' resources projects. As part of these agreements, the Australian Government should provide for pre-qualification of skilled occupations to create greater efficiency and certainty to project proponents during the critical construction phase.

5. Strengthen workforce participation

5.1 That the Australian and state and territory governments develop a national strategy to enhance language, literacy and numeracy skills of job seekers to maximise workforce participation.

5.2 That the Minerals Council of Australia, with support from the Australian Government, Western Australian and Queensland Governments, relevant industry skills councils and state skills bodies, Job Services Australia providers and unions, work with employers in the Pilbara and Bowen Basin on programs that lead to sustainable job outcomes in the mining sector for local people not currently in the workforce.

5.3 That the Australian and state and territory governments consider funding a pilot program for employment brokers to help meet the workforce needs of resources projects based near regional population centres and maximise opportunities for unemployed people. The brokers could work with resources companies, their contractors and service industries to develop recruitment plans and then coordinate the efforts of employment services providers, training organisations, Indigenous organisations and other service providers to meet project needs.

5.4 That the Australian Government fund an industry-based, fly-in fly-out development coordinator in Cairns for two years from July 2010 as a pilot, to develop links between resources projects in remote locations and skilled workers, including local unemployed job seekers. If successful, this measure could be replicated in other appropriate locations, jointly funded by the sector and governments.

5.5 That the Department of Education, Employment and Workplace Relations or the Equal Opportunity for Women in the Workplace Agency work with the Minerals Council of Australia, Australian Petroleum Production & Exploration Association, Australian Constructors Association, unions and education and training providers in appointing a consultant to develop a strategy for attracting and retaining women in the resources and construction sectors.

5.6 The Australian or relevant state government should fund brokerage roles in the Pilbara and Rockhampton to forge stronger links between employers, training providers and

employment services providers. The brokers should develop region-specific and industry-specific, Indigenous workforce development plans that build on the objectives of the memorandum of understanding between the Minerals Council of Australia and the Australian Government, and seek to match Indigenous people to sustainable jobs in the resources sector in the region.

5.7 That the Australian Government, in conjunction with the Government of Western Australia, explore the possibility of expanding the capacity of brokers and mentors, and better use existing business support programs in the Pilbara (as a priority area) to work with existing small-to-medium sized Indigenous contracting businesses and resources companies to better integrate Indigenous businesses into the supply chain for major projects. If successful this model could later be replicated in other regions.

6. Forge stronger ties between industry and education

6.1 That the Minerals Council of Australia and the Australian Petroleum Production & Exploration Association work with governments, unions, industry skills councils and education and training providers to develop a marketing kit to promote agreed career pathways and short and long-term job opportunities in the resources sector.

6.2 That state and territory governments and employer associations work to further develop connections between schools, Trades Training Centres and the resources sector in major resources regions to support employment pathways for secondary school students.

6.3 That the Australian Government work with education authorities to ensure future rounds of Trades Training Centre funding take into account the anticipated strong demand for skills in the resources and construction sectors. Schools with strong links to the resources and construction sectors could be targeted as they should have the greatest capacity to graduate Year 12 students into those sectors.

6.4 That school and vocational education and training officials and stakeholders continue work to ensure that vocational training undertaken in a school context, or as part of a pre-vocational training course, is fully recognised for quality and relevance by employers and training organisations.

6.5 That the Australian and state and territory governments continue to work together on strategies to urgently increase senior school students' participation, attainment and engagement in mathematics and science, noting these subjects open the door to careers in the resources and construction sectors.

7. Address the need for affordable housing and community infrastructure

7.1 That state and territory governments urgently address housing shortages in regions affected by resources operations and in feeder cities such as Darwin and Perth.

7.2 That the Australian Government give consideration to funding infrastructure needs in regions affected by resources operations.

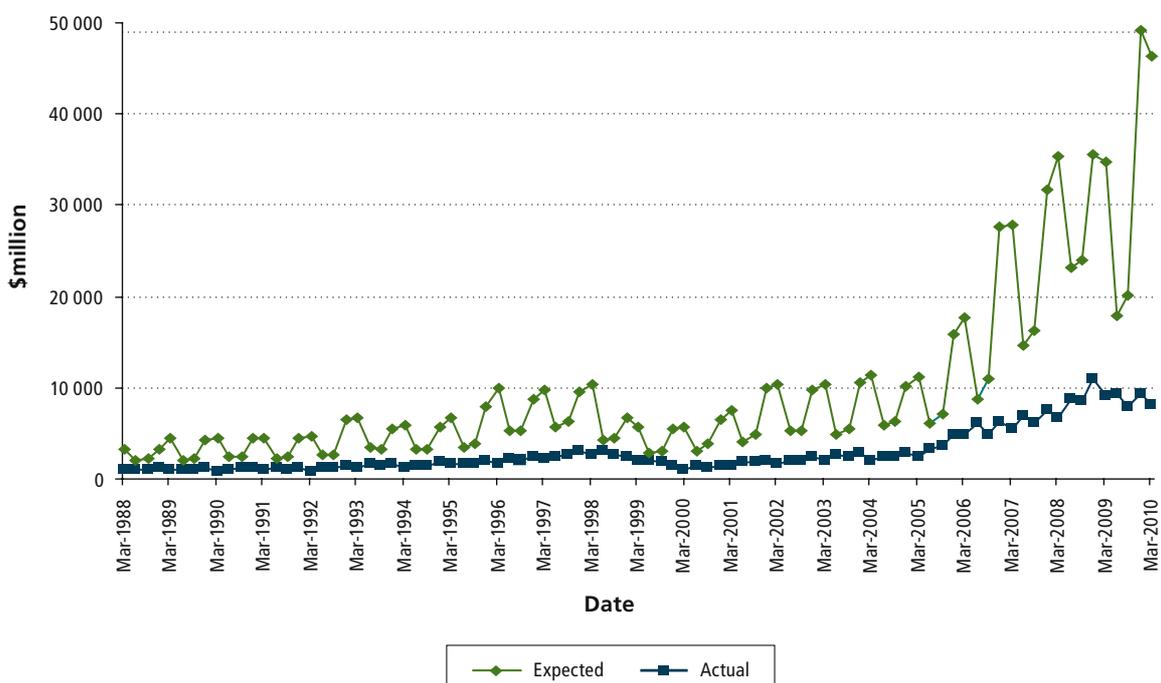
2. Introduction

Assumptions

As of April 2010, there were 75 advanced major resources projects with a combined value of \$109.6 billion, and 286 less advanced projects with a combined value of \$249.9 billion in the pipeline (Lampard et al. 2010).

As Figure 1 shows, actual project approval and expenditure has always fallen short of expectations, although actual expenditure and project approvals over the last two years were the highest they have ever been.

Figure 1: Actual and expected long-term capital expenditure, mining, Australia, 1988–2010



Source: ABS 2010d (DEEWR analysis)

Figure 1 demonstrates why predicting future activity in the resources sector is difficult and why lists of proposed projects must be treated with caution. Final Investment Decisions are influenced by changes in commodity prices, markets, technology, joint venture alignment, global supply and competing investment priorities.

Therefore, while this report provides a detailed account of expected skills and labour needs of major resources projects for the next five years, it does so knowing, on the basis of experience, that some projects will likely be delayed or changed and others will not proceed at all.

In developing its recommendations, the Taskforce has not sought to achieve a perfect match between supply and demand—this is not possible. Consistent with Skills Australia’s approach in its National Workforce Development Strategy, *Australian Workforce Futures*, the Taskforce has sought to broadly identify specialised occupations in the resources and construction sectors that will be in shortage in the forecast period, as well as more general occupations in those sectors for which high-demand conditions will create gaps in other industries.

The Taskforce's recommendations address the need for targeted strategies and specific interventions to improve the supply of people with specialist skills—notably tradespeople and engineers—but also to boost the overall supply of labour.

Rationale

During periods of expansion, the resources sector is often seen to attract labour from other parts of the economy because it offers higher pay; part of the normal operations of labour markets. The sector also makes use of temporary migration where it identifies skills gaps in the domestic labour market and requires a rapid labour market response.

The capacity to offer high wages and ready access to temporary migration has allowed companies to meet their skills shortages with relative ease, with little thought to investment in skills development. To create sustainability, certainty and stability, this has to change.

It could be argued that, given its nature, the resources sector needs little assistance to address its skills deficits. This attitude fails to recognise that every Australian stands to gain through improvements to the sector's skills base and all lose if those skills needs are not met. Resources sector labour shortages quickly become regional, state, then nationwide skills shortages, making local goods and services more expensive and harder to obtain. If all Australians are to benefit from the expanding resources sector, it will be important to maximise job opportunities in the sector as well as help other industries replace workers lost to the resources sector. We also need to ensure the sector does not drive unreasonable wage pressures through other parts of the economy.

Structure

This report is presented in two parts.

Part A maps the location and value of major resources projects that are expected to commence within the next five years, analyses the labour and skills needed for the construction and operation of those projects, and assesses whether the expected supply of skills will be sufficient to meet the demand.

Part B presents a workforce development plan. It consists of:

- targeted measures to address gaps in the supply of skills, including better workforce planning
- increasing the number of trade and degree-qualified professionals
- using temporary migration to meet temporary skills shortages
- encouraging job seekers to undertake training for jobs in the sector
- increasing the participation of women and Indigenous Australians
- encouraging school leavers and other young people to embark on training pathways that lead to resources sector jobs.

The strategy for increasing labour supply also identifies the need for affordable housing and adequate hard and soft infrastructure in communities.

The future

If all of the recommendations in this report are implemented, it is the Taskforce's expectation that the construction and operation of major resources projects will not be held back by major labour shortages. However, **timely development of skills** to meet the needs of resources projects and those of other industries that lose workers to resources projects will take significant effort. It will require **additional training investment in existing workers and training for those not currently in the workforce** so they can quickly become productive employees.

At the highest level, the implementation of the recommendations would lead to **greater cooperation** between industry, unions, national, state and local governments, employment services providers and education and training providers in addressing the resources sector's future skills needs. Companies would engage in **workforce planning** in the knowledge it can help to shape their workforce capacity and help them thrive in tightening labour markets. Companies would also readily **share information about their future skills needs** with governments, employment services providers, education and training providers and others because they know that robust information is vital to the development of effective policies to address supply, which benefits all stakeholders in the long run.

In attending to workforce planning, companies would have regard for the need to engage with regional communities to **increase the participation of locals, including Indigenous people**. Companies would also have strategies in place to **increase the participation of women**. They would have comprehensive strategies to **attract, retrain and retain skilled workers including mature age employees**, providing pastoral care for FIFO/DIDO workers and their families, and see **upskilling workers** as an investment in the future. Companies would use **temporary migration** to meet short-term needs and consider the benefits of using **offsite fabrication** and sequencing labour requirements during construction, to make the most efficient use of available labour and skills.

Companies would have a role in **encouraging school students to consider careers in the sector** and in developing trade and degree-qualified leaders of the future. Companies would increasingly view **unemployed people as a ready source of labour** and know there is a range of support available to ensure they are work ready.

For their part, the **Australian Government and state and local governments would use workforce information provided by companies to inform policies across the spectrum of portfolios—education and training, employment, child care, housing, social infrastructure and health**, to name a few. This would improve the match between skills supply and demand, as noted above, and help companies to **minimise the negative social and workforce impacts of major projects**. Regional development organisations would use the information to make the most of the short and longer term economic opportunities that accompany major projects. Both the **Australian Government and state and territory governments would assist companies to meet their planning and regulatory requirements**.

From the perspective of job seekers, including school students, unemployed people and others hoping to become part of the sector, there would be **clear pathways to employment** at all qualification levels and sustainable jobs at the end of training. **Students would have the interest and grounding in maths and science** to succeed in tertiary education and in the workforce. **Universities and registered training organisations (RTOs) would have the capacity to respond to demand**, and have a greater role, alongside industry skills and training councils,

and industry and professional organisations in shaping education and training so that it better meets industry needs.

In short, if the recommendations of this report are implemented, the Taskforce believes a more highly skilled workforce would help power an even stronger future for the Australian resources sector and contribute to continuing sustainable increases in our nation’s prosperity.



One of four crusher slots at CITIC Pacific Mining’s Sino Iron Project in Western Australia’s Pilbara. Photo courtesy of CITIC Pacific Mining.

3. At a glance—workforce action plan

Vision	Major resources projects have the workforce they need when required and contribute to sustainable economic growth and increased social and economic advantages for Australia.
Objectives	<p>Ensure major resources projects have the workforce they need from 2010 to 2015 and beyond.</p> <p>Improve the resources sector’s approach to workforce planning and its willingness to share information about its skills needs.</p> <p>Attract new people with relevant skills into the resources and construction sectors.</p> <p>Build employees’ skills and implement strategies to retain people.</p> <p>Ensure industries that lose workers to the expanding resources sector can access a supply of job-ready labour.</p>
Recommendations	<ul style="list-style-type: none"> • Promote workforce planning and sharing of information • Increase the number of trade professionals • Graduate more engineers and geoscientists • Meet temporary skills shortages with temporary migration • Strengthen workforce participation • Forge stronger ties between industry and education • Address the need for affordable housing and community infrastructure
Success indicators	<p>Resources projects have the labour and skills they need when required.</p> <p>Continuous improvement in workforce planning and development and increased retention of employees.</p> <p>Increase in the number of people in the sector, including a higher number and proportion of women and Indigenous people.</p> <p>Increased proportion of people with formal qualifications in the sector.</p> <p>Unemployed people get jobs in either the resources sector itself or as a result of the expansion of the resources sector.</p> <p>Project proponents sequence labour requirements.</p>

PART A

THE SKILLS NEEDS OF MAJOR RESOURCES PROJECTS

4. Projects

This chapter outlines major resources projects expected to commence construction and/or come into production over the next five years.

The Australian Bureau of Agricultural and Resource Economics (ABARE) compiles a list of major minerals and energy projects expected to be built over the following five years and updates this information every six months. Projects included on the list have a minimum value of \$40 million, with \$20 million for gold projects. This Taskforce report used the April 2010 version as the basis of its analysis.

The ABARE list identifies 361 resources projects:

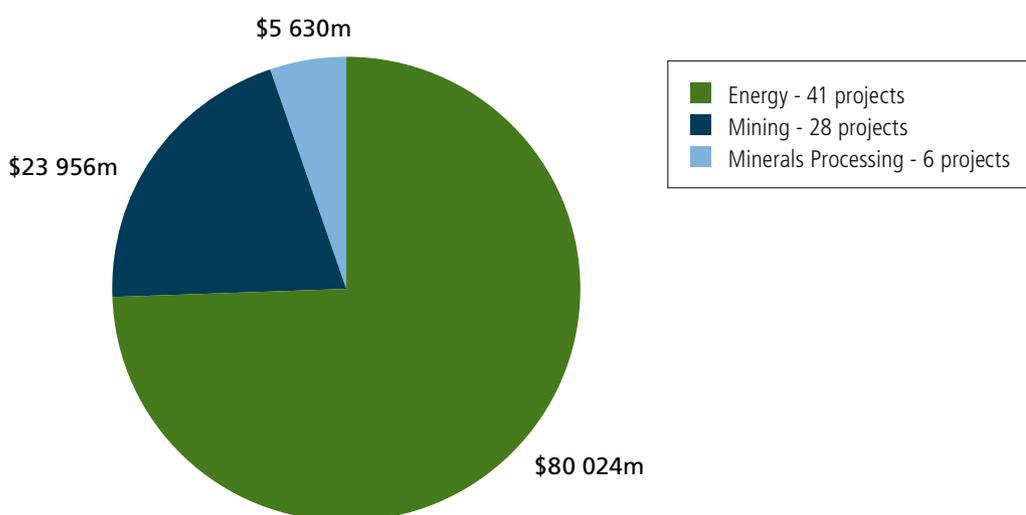
- 230 new projects
- 121 projects expanding existing activities
- 10 redevelopments, upgrades or refurbishments.

Since the April 2010 ABARE list, new announcements have been made, including BHP's potential \$24 billion LNG project in Western Australia, announced on 24 May 2010.

4.1 Projects underway or in the pipeline

The ABARE list provides a guide to the projects that are reasonably certain of going ahead (Lampard et al. 2010). The ABARE list identifies 75 advanced major projects, with a value of \$109.6 billion. Projects in this category are either 'committed' or 'under construction'. Most *advanced projects* are energy related, as shown in Figure 2. Figure 3 shows the projects by location.

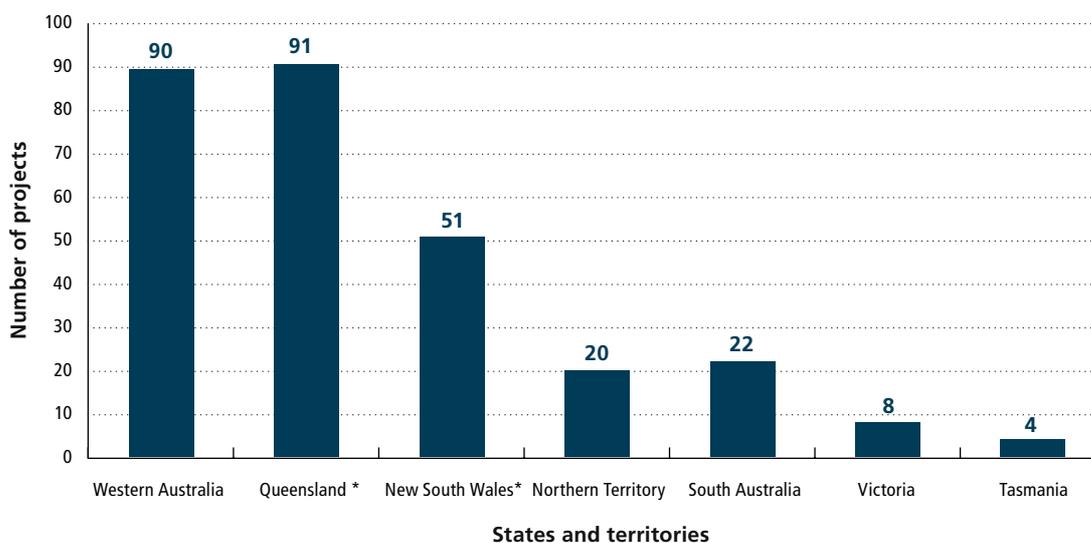
Figure 2: Value of advanced projects, by resource type, Australia, April 2010



Source: ABARE Minerals and energy, major development projects, April 2010 listing (Lampard et al. 2010)

As the ABARE list does not contain construction value information for many less advanced projects, it is not possible to show distribution of projects by value.

Figure 4: Less advanced projects—state share, Australia, April 2010



* some projects cross state borders

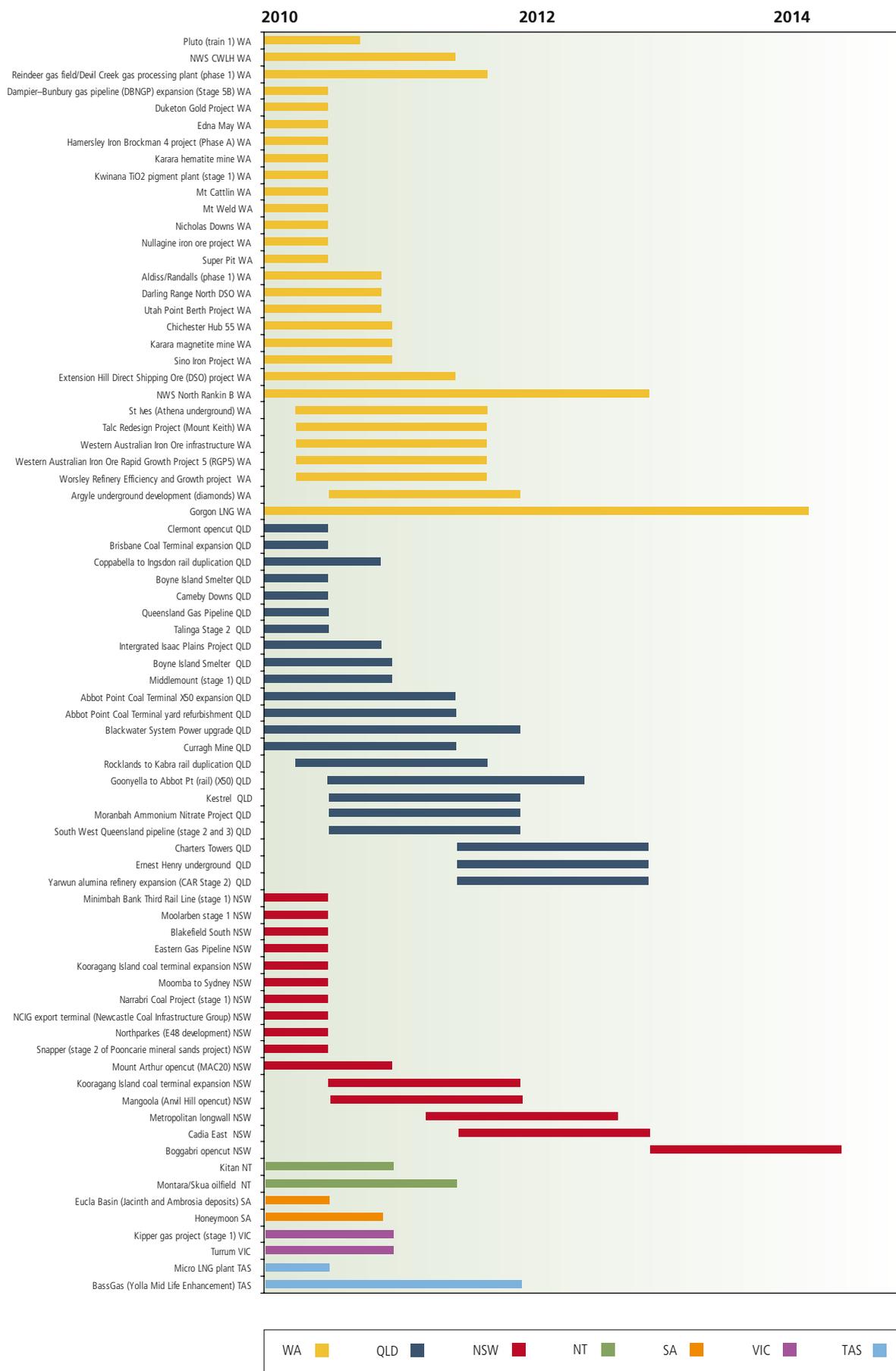
Source: Taskforce analysis of ABARE unpublished data

4.2 Project timing

The ABARE list contains an expected operations commencement date but not a construction commencement date. For the purpose of its analysis, the Taskforce relied on additional sources (including companies, state governments and submissions) and made some assumptions about the length of time required for particular activities. The Taskforce has assumed the construction of a LNG train takes three years and construction of mining operations takes 18 months.

Figure 5 shows when advanced projects are likely to commence construction and the expected construction duration. Production is assumed to commence immediately upon completion of construction. Appendix IV shows when advanced and less advanced projects are likely to commence.

Figure 5: Construction schedule of advanced projects



Source: Taskforce analysis of ABARE unpublished data

5. Demand for labour and skills

This chapter analyses the resources sector's national labour and skills needs over the next five years. The information in the chapter is informed by modelling undertaken for the Taskforce, including by the Department of Education, Employment and Workplace Relations (DEEWR) and the National Centre for Vocational Education Research (NCVER). The modelling is available in full at www.deewr.gov.au/nrset.

The Taskforce's modelling suggests:

- The number of short-term construction jobs is likely to peak at around 45,000 during 2012 and 2013 with strong jobs growth for technicians and tradespeople and machinery operators and drivers.
- Employment growth of 4.9 per cent per annum is expected over the next five years creating around 61,500 new jobs. There will be strong demand for professionals in addition to the skills listed above.
- Replacement demand in mining operations could be around 16,000 persons per annum, including approximately 3,000 retirements.
- The number of new jobs in gas operations will be between 1,800 and 3,200. There will be strong jobs growth for drillers (Queensland only), operators, electrical trades and mechanical technicians.
- Replacement demand in gas operations could be around 2,000 persons per annum, including approximately 500 retirements.

Modelling outcomes were discussed with the Western Australian Department of Training and Workforce Development on 19 May 2010, and the Queensland Department of Employment, Economic Development and Innovation, and the Department Education and Training on 25 May 2010. Both states supported the methodology used and considered the modelling outcomes broadly consistent with their own analysis.

5.1 Trends in resources sector product demand

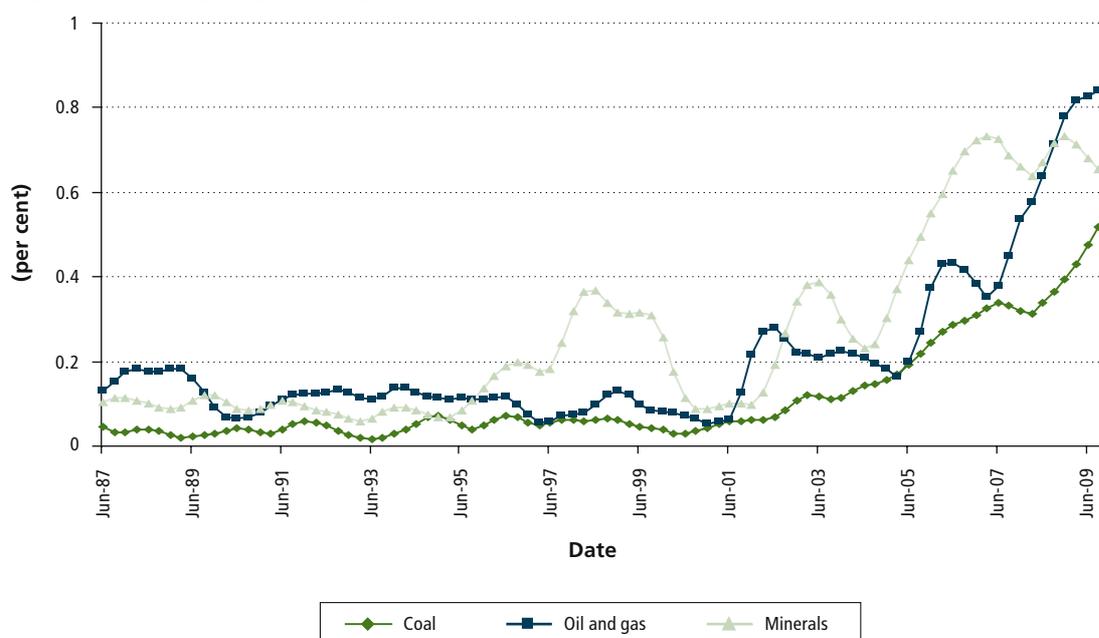
Labour demand is driven by demand for resources.

Developments in export markets have a major influence on the domestic demand for skills. The Reserve Bank of Australia (RBA) and the Australian Treasury have recently drawn attention to strong overseas demand for Australian resources.

In its May 2010 Statement on Monetary Policy, the RBA noted that mining investment has been at record levels as a share of GDP and further increases are expected. This reflects the high level of commodity prices in recent years.

Figure 6 shows mining investment growth as illustrated by the value of mining engineering over the past 20 years.

Figure 6: Mining engineering work done, per cent of nominal GDP, 1987–2009



Source: Reserve Bank of Australia 2010, *Analysis of ABS data*

The RBA predicted a substantial increase in mining investment—Treasury expects it to grow by 19 per cent in 2010–11 and 20.5 per cent in 2011–12. Strong LNG sector growth, and major resources projects in the pipeline, may significantly increase engineering construction investment as a share of total business investment over coming years (Australian Treasury, 2010: pp. 2–21).

The Australian Treasury (2010: pp. 2–21) further noted that LNG sector growth has the potential to increase Australia’s LNG production capacity four fold—although it should be noted that Australia has never before supported construction of more than two gas trains concurrently and such an expansion has never occurred anywhere in the world beyond Qatar.

5.2 Demand for construction labour and skills

5.2.1 Modelling approach

DEEWR prepares annual industry employment projections for the next five years. The latest of these reports covers up to 2014–15 and the projections are an annual average for the five years. Employment in the whole construction sector is expected to grow at an average rate of 2.4 per cent per annum. This compares with an average annual growth rate of 1.8 per cent across all industries over the same period (DEEWR, 2010a).

However, the scale of investment in resources projects has grown dramatically in recent years. In real terms, the volume of engineering construction in Australia increased from \$9.5 billion in 2000–2001 to \$47.6 billion in 2008–2009 (Richardson, 2010, p.1). ABARE, Treasury and the RBA expect unprecedented project construction in the next five years. This suggests potential employment growth in resources construction based on historical trends for the whole

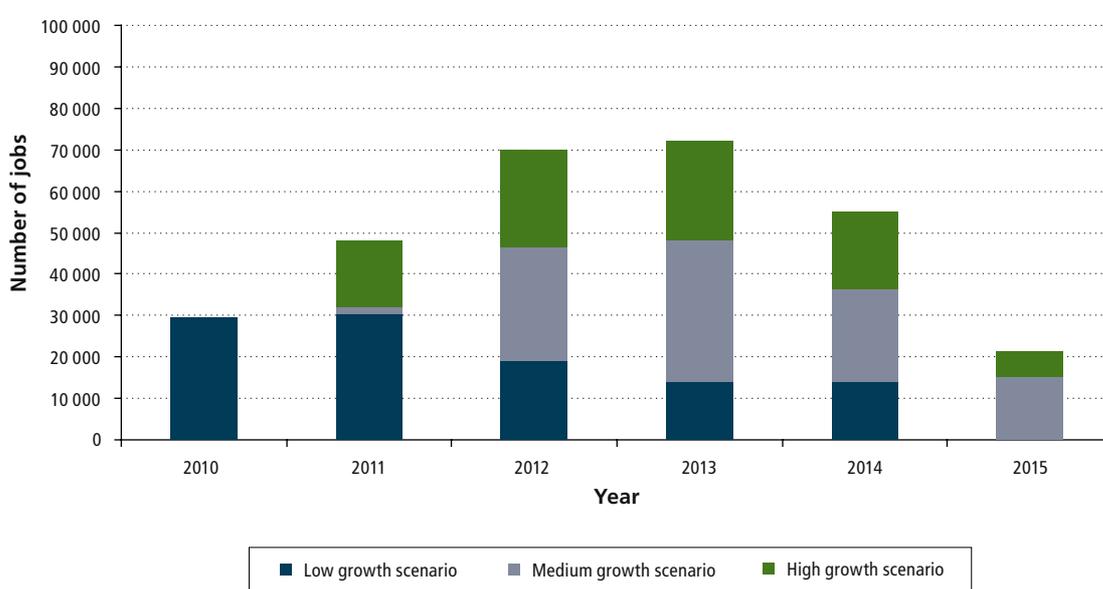
construction sector is likely to underestimate demand. The Taskforce modelled demand on the basis of a typical construction sector employment profile for a given value of construction and applied it to the expected value of construction activity.

5.2.2 Modelling outcomes

Projected increase in short-term jobs for construction workers

Construction jobs on resources projects can last from a few months to a few years. Under the medium-growth scenario, the maximum number of additional workers required will be around 45,000 in both 2012 and 2013 (Figure 7). As noted earlier, announcements about new projects are made regularly, so the projected decline in construction employment for 2014 and 2015 may not occur. The Taskforce therefore suggests projections should be revised every 12 months.

Figure 7: Estimated construction employment by year—three growth scenarios



Source: Taskforce estimates based on analysis of ABARE unpublished data

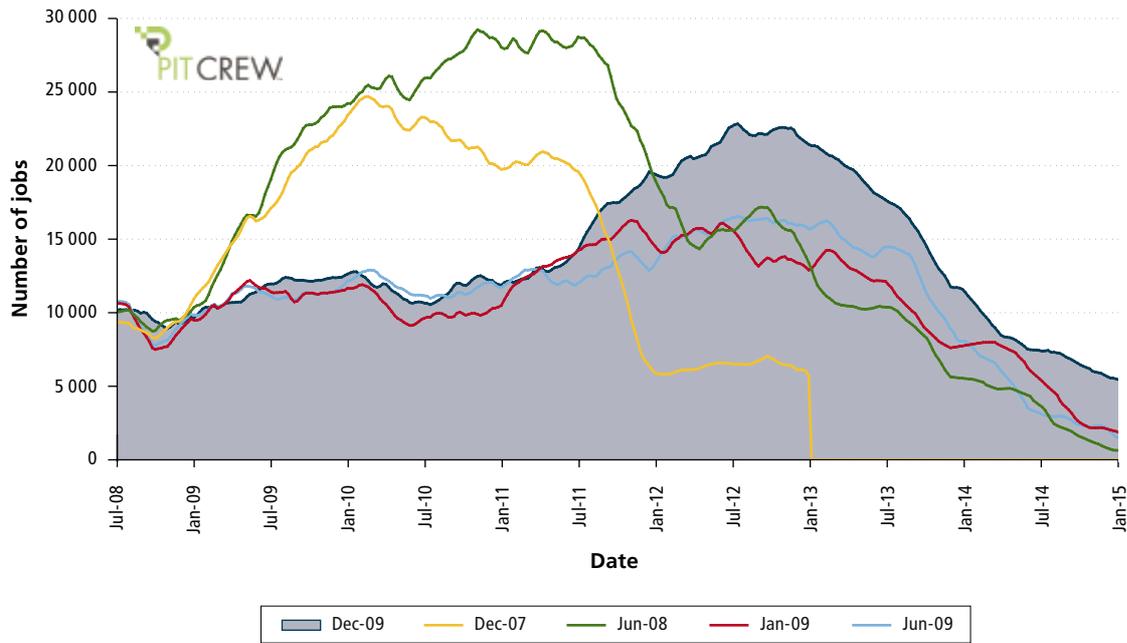
State analysis

The Taskforce’s medium and high-growth scenarios for construction labour demand are broadly consistent with projections prepared for the Government of Western Australia and projections prepared by the Queensland Major Contractors Association (QMCA).

Figure 8 shows total construction labour demand for Western Australia in December 2009 compared to previous forecasts. If current forecast labour demand is correct, the need for labour would double from approximately 11,000 onsite now, to approximately 22,500 in late 2012.

The December 2007 (yellow) and June 2008 (green) lines represent previous forecasts of labour demand, which were significantly higher than actual labour demand.

Figure 8: Forecast total construction labour demand in Western Australia

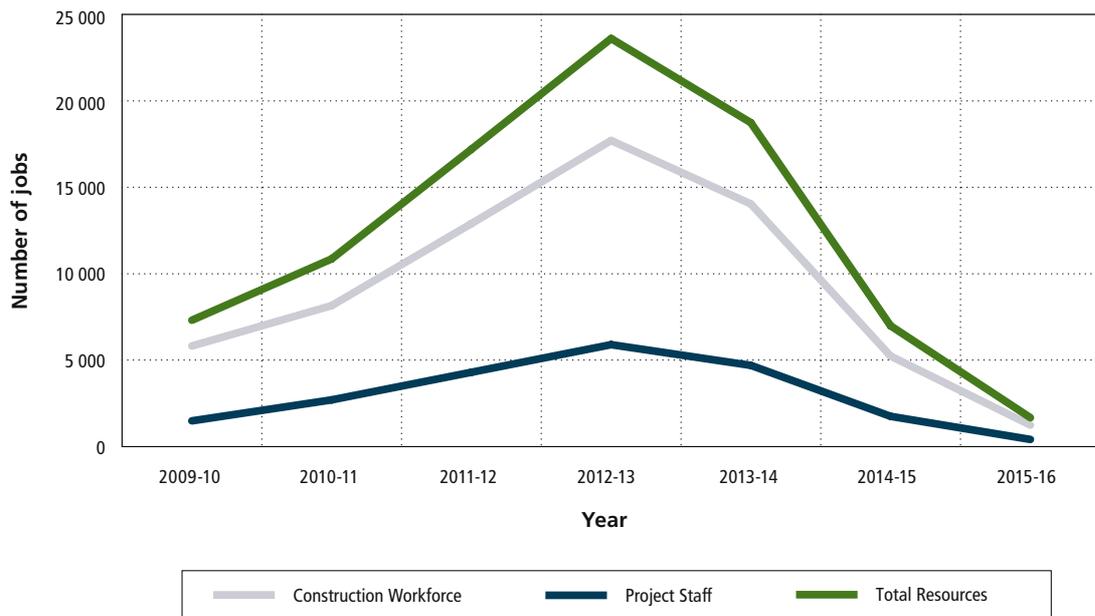


Source: The WA Department of Training and Workforce Development 2010

QMCA's analysis indicates privately funded resources and energy projects will fill the gap left by the anticipated reduction in public sector investment by 2011–2012.

If the current planned mine, ports, rail and resources infrastructure projects proceed in parallel with the coal seam methane to liquefied natural gas (CSM-LNG) Energy projects, QMCA suggests major contractors will need to increase project staff and construction workers by 120 per cent to 23,660 in 2012–2013. The steep decline in 2013–2014, seen in Figure 9, is a result of uncertainty of forward project activity, not a view that activity will slow dramatically.

Figure 9: 2010 Major projects workforce demand, resources and construction projects – Queensland



Source: Queensland Major Contractors Association (2010)

5.3 Mining production

Demand for operational skills in mining will increase until 2015 and beyond. The key to this growth is export markets, especially in Asia. The world economy, including Australia's key markets, appears to be strengthening. At the time of the 2010–11 Budget, Treasury expected export volumes would increase in line with the anticipated recovery in global economic activity.

Projections of output and commodity prices

In March 2010 ABARE published its projections on likely trends in output and commodity prices. These projections show strong growth in production, largely to serve export markets in major resources commodities.

ABARE suggests world prices for many energy and minerals commodities should recover in 2010 and 2011 and while prices are generally projected to decline in real terms beyond 2011, they will remain above historical averages.

The net effect of higher commodity prices and the anticipated strong growth in output is a significant rise in demand for skills.

5.4 Demand for labour and skills in mining operations

The modelling suggests mining sector employment average growth of 4.9 per cent a year from 2008 to 2015.

Table 2 presents aggregated data on likely demand by occupation. Further modelling of employment growth, disaggregated by major cities and other places of employment, suggests around 25 per cent of mining sector, professional employment growth will occur in capital cities.

Table 2: Projected employment in mining operations, 2015

Occupation	Base employment (2008)	Employment growth	Projected employment (2015)
Managers	13,977	5,571	19,548
Professionals	24,080	9,598	33,678
Technicians and tradespeople	37,833	15,080	52,913
Community and personal service workers	733	292	1,024
Clerical and administrative workers	13,791	5,497	19,287
Sales workers	597	238	835
Machinery operators and drivers	53,621	21,372	74,993
Labourers	8,140	3,244	11,384
Other	1,675	667	2,342
TOTAL	154,446	61,559	216,005

Source: ABS 2007; ABS 2008a

5.5 Demand for labour and skills in gas operations

Employment growth in Western Australia and Queensland will depend on the number of LNG trains constructed by 2015, the location of trains and whether they are tied to existing infrastructure ('brownfields') or are 'greenfields' projects.

In Queensland, for example, all of the coal seam gas/liquefied natural gas (CSG/LNG) projects will be greenfields. Owing to the nature of CSG technology, which requires significant numbers of drillers, each train will need between 550 and 650 professional and technical staff during operations.

Energy Skills Queensland has projected new jobs growth by occupation based on slow, moderate and rapid growth scenarios (Table 3 – see NRSET Technical Paper for further information). This modelling assumes base employment of 1,000 people in all scenarios, that is, there were 1,000 people already employed in the industry in 2009.

Table 3: Energy Skills Queensland, new jobs growth by occupation, Queensland, projections to 2015

Occupational Groups by Skills and Activities	'Slow Economic Growth' (4 Trains)			'Moderate Economic Growth' (6 Trains)			'Rapid Economic Growth' (8 Trains)		
	2010	2015	2020	2010	2015	2020	2010	2015	2020
ENGINEERING (Professional and Para-professional Skills)	205	340	373	341	580	630	374	715	756
SCIENCE (Professional and Para-professional Skills)	73	68	75	109	103	113	124	133	149
VOCATIONAL OCCUPATION (Technical Skills)	831	2,134	2,645	1,248	3,197	3,964	1,328	3,584	4,854
Drilling	476	990	990	715	1,484	1,484	741	1,820	1,953
Electrotechnology (Electrical)	35	146	232	53	218	347	61	253	447
Field Construction	24	44	44	36	66	66	43	88	88
Mechanical (Diesel Fitting)	75	201	274	113	301	410	128	309	482
Process Plant Operations	190	682	1017	285	1022	1525	312	999	1724
Water Management (Operations)	29	71	88	43	106	132	43	115	160
VOCATIONAL OCCUPATION (Non Technical Skills)	205	378	453	306	567	680	198	677	857
Occupational Health and Safety	38	84	104	56	126	156	68	154	190
Cultural Heritage	67	85	80	100	127	100	82	169	162
Admin/Logistics/Transport/ Warehouse	100	109	269	150	314	404	148	354	505
UNSKILLED LABOUR	67	134	147	100	200	222	115	253	284
OTHER	0	31	58	0	47	86	0	31	91
TOTAL	1,381	3,085	3,752	2,104	4,694	5,659	2,239	5,393	6,991

Source: Energy Skills Queensland (ESQ), 2009

The Taskforce notes if only two trains become operational by 2015, the number of technical and professional staff needed for operations in Queensland will be around 1,200.

In Western Australia, the number of employees required per train will depend on the workforce model adopted (i.e. FIFO, residential or a mix of the two) and the number of greenfields projects. When an additional LNG train is built alongside an existing train (a brownfields development), it requires significantly fewer operational employees due to existing processes, work flows and team capability.

Discussions with industry suggest the number of employees required for a train at a greenfields site can range from around 150 to 300 depending on whether the workforce is residential, a mix of residential and FIFO or all FIFO. A typical workforce includes plant operators (around 50 per cent), maintenance technicians (mechanical and electrical trades—around 35 per cent) and engineering professionals and paraprofessionals (around 15 per cent). Additional trains in the same LNG brownfields development require about 10 to 20 per cent of the number of employees required for the first train.

Table 4 shows the number of operational positions required by 2015 under three growth scenarios for Western Australia. Estimates assume:

- The first two projects are greenfields, utilise FIFO and require 260 on site employees per train.
- The remaining projects are brownfields (additional trains in an existing site) and require between 25 and 50 employees per train.

Table 4: Growth scenarios for Western Australia (4, 6 and 8 trains)

Estimated employment break down per train	Low growth scenario (4 trains)	Medium growth scenario (6 trains)	High growth scenario (8 trains)
Operators	300	335	375
Maintenance technicians (mechanical/electrical trades)	210	235	265
Engineering	90	100	110
TOTAL	600	670	750

These estimates do not include supporting roles such as logistics, catering and security.

The Taskforce considers it likely there will be two to four new trains operating in Queensland by 2015, and four to six new trains in Western Australia. This would create between 1,200 and 2,500 professional and trade jobs in operations in Queensland and between 600 and 700 in Western Australia.

The above estimates do not account for any increase in employment in Western Australia's offshore LNG industry. Employment growth offshore is expected to be low so the Taskforce has not attempted to make any projections. The number of new jobs will depend on the development concepts that are approved.

Companies in the gas sector predicted growth in demand for labour in occupations across the entire scope of operations and maintenance as the sector undergoes rapid expansion in new fields such as CSG. LNG trains typically take three years to build so the operational workforce is expected to grow significantly from 2013 to 2015.

5.6 Replacement demand

Over time, people leave their current jobs for another in the same sector (turnover) or they leave the sector or retire (replacement demand). There is limited data available concerning these movements.

SkillsDMC has estimated job turnover rates for drilling (29 per cent), quarrying (17 per cent), and mining (13.3 per cent) (SkillsDMC, 2010).

Sector turnover rates vary substantially and one large resources company advised the Taskforce that turnover for its FIFO workers is double that of other employees—up to 30 per cent a year.

Table 5 shows the responses of 20 companies to questions about their annual turnover rate over the last three years.

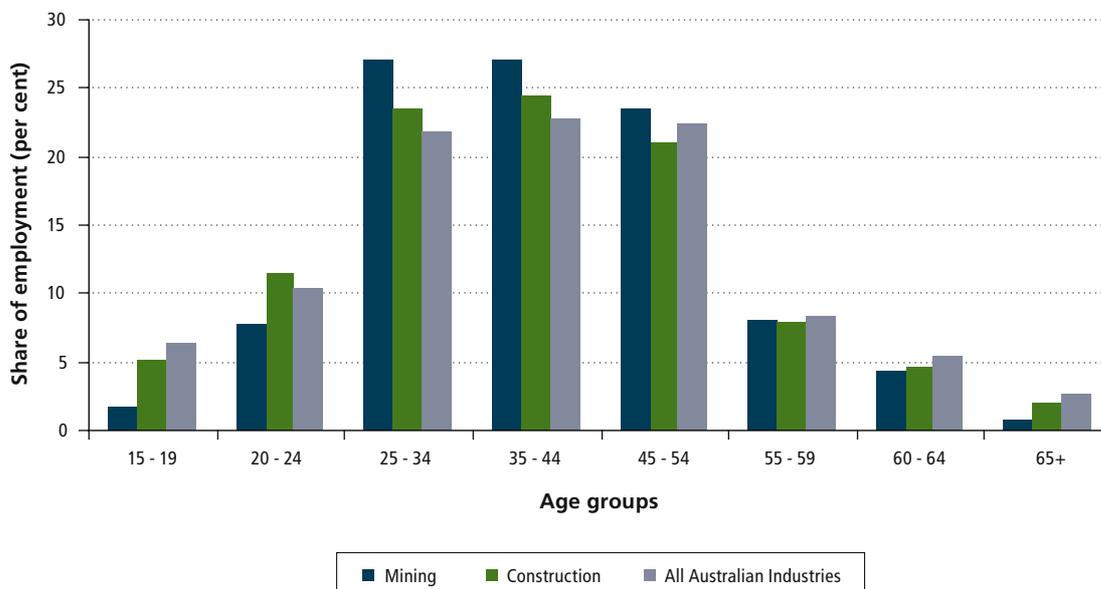
Table 5: Reported employee turnover, 2007 to 2009

Year	Range of reported turnover	Most commonly reported annual turnover
2007	0–40%	5–20%
2008	1–85%	20–30%
2009	5–20%	40–90%

Source: NRSET survey 2010

Figure 10 examines the age profile of the mining and construction sectors compared to all industries as at February 2010.

Figure 10: Age profile of the mining (includes oil and gas extraction) and construction industries, February 2010



Source: ABS 2010e

DEEWR estimates of retirement from the mining, oil and gas sectors suggest 7 per cent of the current workforce will retire over the next five years and 16 per cent over the next 10 years.

Table 6 shows estimated mining employee losses to retirement by occupation over the five years from 2010 to 2015. It suggests around 16,000 will retire, including around 2,700 professionals.

Table 6: Projected losses from mining sector employment to retirement (2010 to 2015), by occupation

Occupation	Mining	5-year loss (no.)
Managers	15,166	-1,940
Professionals	26,460	-2,664
Technicians and tradespeople	43,696	-3,794
Community and personal service workers	327	-30
Clerical and administrative workers	14,307	-1,375
Sales workers	477	-35
Machinery operators and drivers	53,899	-5,427
Labourers	9,030	-868
Total	163,362	-16,133

Source: Access Economics 2009 (DEEWR analysis)

Trend analysis for major occupations in the resources sector suggests an average Gross Replacement rate of around 10 per cent a year with lower rates for the professions. This suggests there will be around 16,000 vacancies in mining operations and around 2,000 in gas operations each year as a result of replacement demand.

6. The supply of labour and skills

This chapter analyses the expected supply of skilled labour from domestic sources and migration between 2010 and 2015.

Skills for the resources sector can be drawn from the existing stock of skills in the national labour market (employed and unemployed people), from vocational and higher education, and from temporary and permanent migration.

A summary of skills supply, including from the Taskforce's modelling, suggests:

- Over 600,000 people are currently unemployed, including around 48,000 professionals and 60,000 tradespeople across all states and territories.
- The trades workforce will increase by 6.6 per cent nationally to 2015 according to the NCVER average case scenario.
- The number of completions from university engineering courses are projected to grow by 11.2 per cent from 6,312 in 2008 (latest data available) to 7,020 in 2014. However, the number of geoscience graduates is likely to fall over that period.
- Migration will continue to be an important source of supply, particularly for mining/petroleum engineers and geoscientists.

6.1 Australia's existing stock of skills

The domestic supply of skills to the resources sector can come from:

- people who have the relevant skills but are unemployed or working in other sectors
- people who are unskilled for the sector, whether employed or unemployed, but could undertake training to become suitably skilled for the jobs available.

Table 7 examines Australia's stock of skills in selected professional, technician and trade occupations including both employed persons and those who are now unemployed but recently worked in that occupation. The data indicate that in early 2010 Australia had around 48,000 unemployed professionals as well as over 60,000 unemployed technician and trades workers.

Table 7: Number employed and unemployed for selected occupation, February 2010

Occupation	Employed*	Unemployed**
All professional occupations	2,300,704	48,172
Engineering professionals	119,645	3,794
Natural and physical science professionals	90,544	2,233
All technicians and trade occupations	1,583,681	60,857
Automotive electricians and mechanics	94,203	2,425
Building and engineering technicians	115,725	4,188
Electricians	126,972	3,269
Electronics and telecommunications tradespeople	90,616	3,875
Fabrication engineering tradespeople	81,933	3,532
Mechanical engineering tradespeople	135,105	4,366
Miscellaneous technicians and tradespeople	61,375	1,684
Plumbers	72,274	2,427

Source: ABS 2010e

*employed by occupation **unemployed by last occupation

Clearly there are unemployed professionals and tradespeople who could play a role in alleviating resources sector skills shortages.

6.2 Unemployment by occupation and by state and territory

Table 8 provides a state breakdown of unemployed people previously employed in selected professional and technical and trades workers occupations in the last two years³. There were 1,000 fabrication engineering trades workers and 500 electricians in Western Australia.

Table 8: Unemployment by selected previous occupation, by state and territory, 2010

Professionals	Unemployed								AUS TOTAL
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
All professional occupations	18,465	12,200	8,167	2,793	4,424	869	206	1,048	48,172
Engineering professionals	1,091	1,085	511	585	490	0	0	32	3,794
Natural and physical science professionals	663	179	676	141	417	45	0	112	2,232
All technicians and trade occupations	17,652	14,220	14,975	3,786	8,060	1,205	481	478	60,857
Automotive electricians and mechanics	674	584	654	121	154	204	0	34	2,425
Building and engineering technicians	1,576	777	595	316	812	32	48	32	4,189
Electricians	1,139	651	691	150	504	66	68	0	3,270
Electronics and telecommunications tradespeople	1,302	958	1,047	172	298	34	18	46	3,873
Fabrication engineering tradespeople	812	964	530	54	1,000	172	0	0	3,533
Mechanical engineering tradespeople	1,031	554	895	474	1,283	54	75	0	4,366
Miscellaneous technicians and tradespeople	632	201	383	89	379	0	0	0	1,686
Plumbers	1,115	230	759	122	177	24	0	0	2,427

Source: ABS 2010e; ABS 2010f

While the absolute numbers of unemployed are low in towns near major resources projects there are still significant numbers of unemployed people in the nearest capital cities, for example, 45,000 in Perth and 52,800 in Brisbane (DEEWR, 2010b).

³ These data are derived from the Australian Bureau of Statistics (ABS) Labour Force Survey, which is based on a sample of approximately 29,000 private dwellings and covers about 0.33 per cent of the Australian civilian population aged 15 or over.

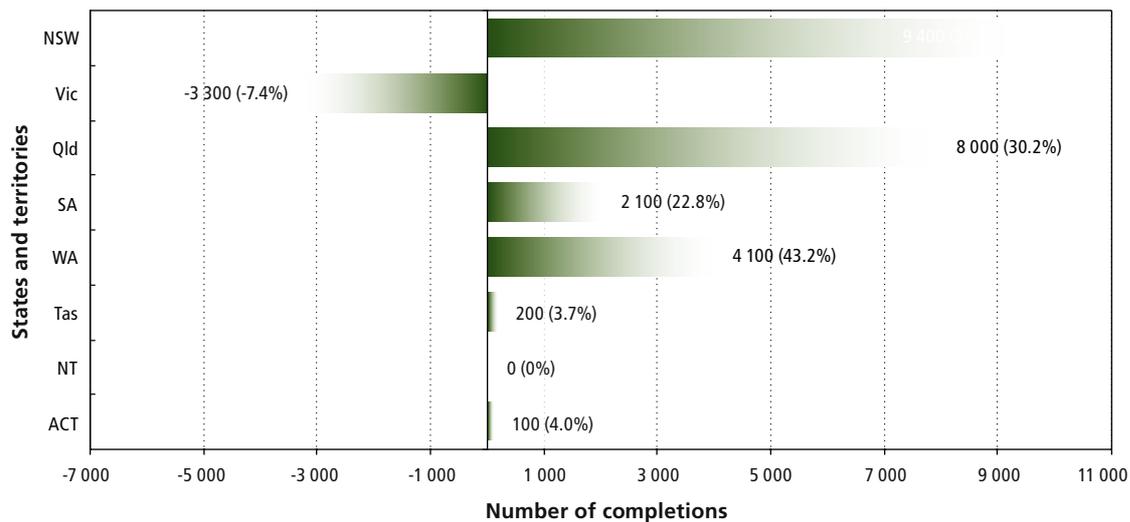
6.3 New supplies of skills

6.3.1 Vocational education and training

Recent trends in skills formation

Between 2005 and 2009, Western Australia and Queensland increased their output of apprentices and trainees to meet the increased demand for skills (Figure 11).

Figure 11: Number and percentage change in apprentice and trainee completions by state and territory, 2005 to 2009



Source: Karmel and Mlotkowski, 2010

6.3.2 Projected skills formation

The Taskforce engaged the National Centre for Vocational Education Research (NCVER) to develop projections of the future supply of tradespeople for 2010–2020 with three possible scenarios: best, average and worst case. The best case scenario uses the highest commencement rate and lowest cancellation/withdrawal and attrition rates. The worst case scenario uses the lowest commencement rate and highest cancellation/withdrawal and attrition rates. The average case scenario uses average rates.

The resources sector will need to compete with other industries to engage the supply of tradespeople. Resources sector trades, expected to experience the highest rates of growth, are shown in Table 9.

Table 9: Projected growth in skills supply for selected technicians and tradespeople, 2010 to 2015, best, average and worst case scenarios

	2010	2015 Best Case Scenario	2015 Average Case Scenario	2015 Worst Case Scenario
Building and engineering technicians	122,100	122,978 +878 +1 %	110,622 -11 478 -9 %	98,156 -23,944 -20 %
Fabrication engineering tradespeople	82,400	104,283 +21,883 +27 %	88,270 +5,870 +7 %	75,372 -7,028 -9%
Mechanical engineering tradespeople	141,400	167,428 +26,028 +18 %	149,534 +8,134 +6 %	132,057 -9,343 -7%
Bricklayers, and carpenters and joiners	141,400	190,811 +49,411 +35 %	164,071 +22,671 +16 %	141,871 +471 0 %
Electricians	132,200	184,346 +52,146 +39 %	154,256 +22,056 +17 %	129,788 -2 412 -2 %
Electronics and telecommunications tradespeople	101,400	114,518 +13,118 +13 %	97,261 -4,139 -4 %	81,704 -19,696 -19 %
Total Trades	1,593,000	1,975,502	1,697,371	1,412,668

Source: Karmel and Mlotkowski, 2010

Table 10 shows projected growth in supply in the skilled trades in the critical period 2010 to 2015 when many major projects are scheduled.

Table 10: Projected new skill formation in the skilled tradespeople Australia, 2010 to 2015

Trade	2010	2015	variation
Agricultural, medical and science technicians	49,700	64,460	14,760
Building and engineering technicians	122,100	110,622	-11,478
Automotive electricians and mechanics	98,300	107,909	9,609
Fabrication engineering tradespeople	82,400	88,270	5,870
Mechanical engineering tradespeople	141,400	149,534	8,134
Bricklayers, and carpenters and joiners	141,400	164,071	22,671
Floor finishers and painting tradespeople	60,400	55,815	-4,585
Glaziers, plasterers and tilers	67,000	71,866	4,866
Plumbers	73,400	82,508	9,108
Electricians	132,200	154,256	22,056
Electronics and telecommunications tradespeople	101,400	97,261	-4,139
Wood trades workers	32,100	33,335	1,235
Miscellaneous technicians and tradespeople	51,700	45,670	-6,030
Total trades	1,153,500	1,225,577	72,077

6.3.3 Skills formation by state and territory

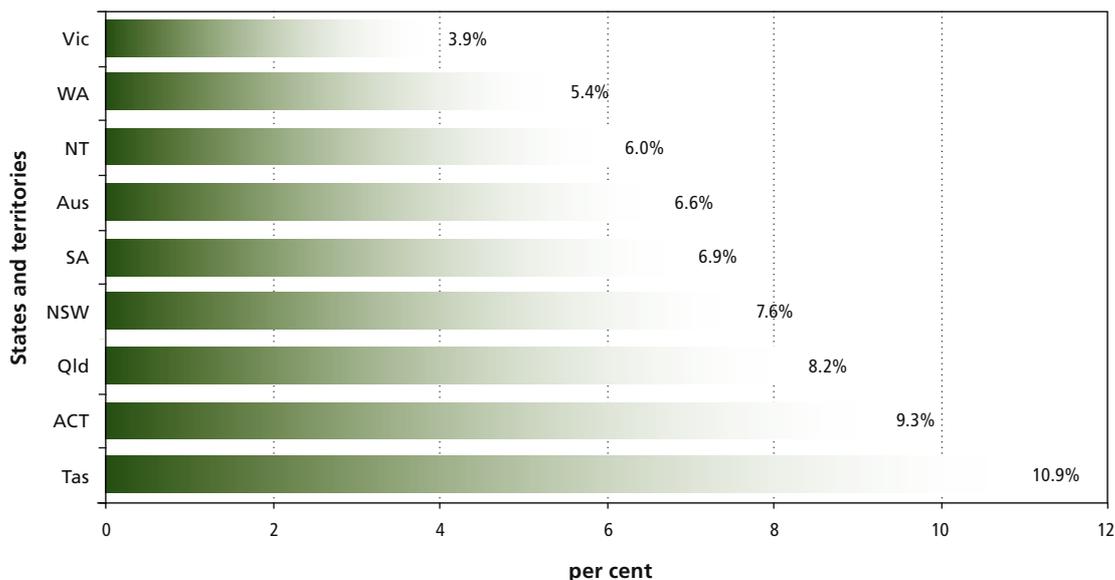
Table 11 and Figure 12 show that under the average case scenario, the supply of technicians and tradespeople in Western Australia will grow by 5 per cent to 2015. This is unlikely to be sufficient to meet demand.

Table 11: Projected supply of technicians and tradespeople by state and territory, 2010 to 2015

	2010	2015 best case scenario	2015 average case scenario	2015 worst case scenario
New South Wales	464,900	584,119 +119,219 +26%	500,219 +35,319 +8%	415,150 -49,750 -11%
Victoria	386,200	468,605 +82,405 21%	401,449 +15,249 +4%	331,585 -54,615 -14%
Queensland	337,400	424,625 +87,225 +26%	364,980 +27,580 +8%	304,420 -32,980 -10%
South Australia	115,700	144,485 +28,785 +25%	123,628 +7,928 +7%	102,600 -13,100 -11%
Western Australia	213,300	257,151 +43,851 +21%	224,780 +11,480 +5%	190,953 -22,347 -10%
Tasmania	32,800	42,826 +10,026 +31%	36,375 +3,575 +11%	30,080 -2,720 -8%
Northern Territory	22,000	26,976 +4,976 +23%	23,324 +1,324 +6%	19,487 -2,513 -11%
Australian Capital Territory	20,700	26,715 +6,015 +29%	22,617 +1,917 +9%	18,393 -2,307 -11%
Australia	1,593,000	1,975,502	1,697,372	1,412,668

Source: Karmel and Mlotkowski, 2010

Figure 12: Projected growth in the supply of tradespeople, 2010 to 2015, by state and territory, percentage change, average case scenario

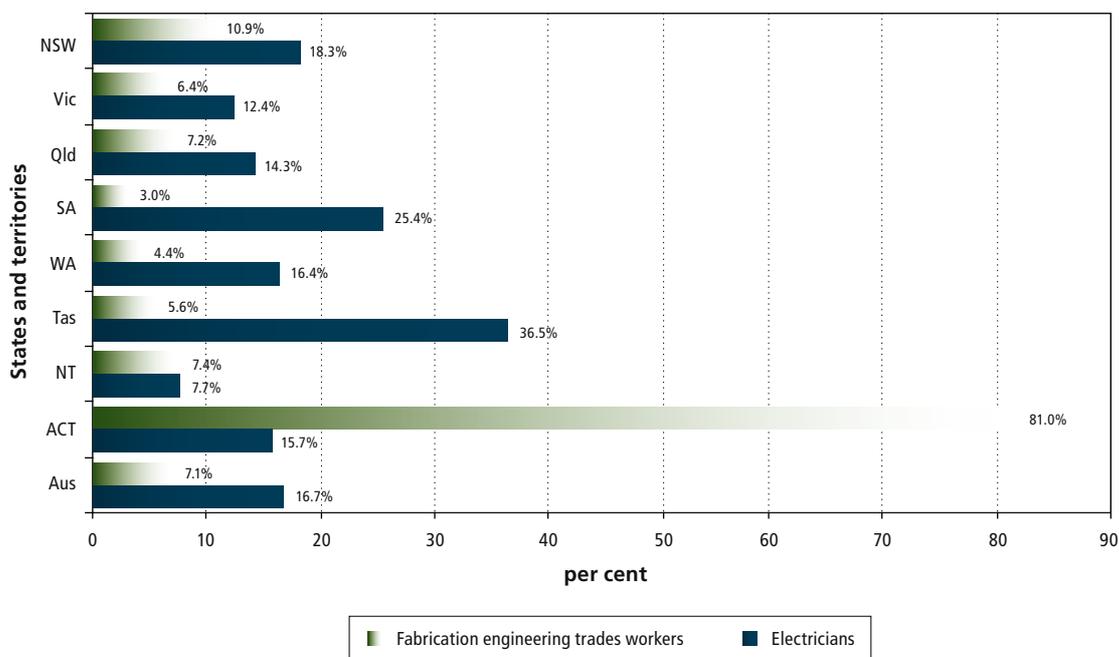


Source: Karmel and Mlotkowski, 2010

6.3.4 State skills formation by occupation

The net supply of electrical tradespeople is expected to grow more slowly in Western Australia than in other states (see Figure 13), which is of particular concern given demand for electrical tradespeople is expected to increase from 2012 in Western Australia.

Figure 13: Projected growth in supply of selected trades, 2010 to 2015, by state and territory, percentage change, average case scenario



Source: Karmel and Mlotkowski, 2010

6.3.5 Projections on the future supply of trade skills to the resources sector

NCVER analysis (average case scenario) suggests if the resources sector (including construction) maintains its share of tradespeople it will employ approximately 95,000 in 2015.

6.3.6 The resources sector's role in trade skills formation

The resources sector's overall share of trade apprentices is lower than its share of trade employment. The NCVER examined the contribution made by the resources sector to the employment of trade apprentices relative to their trade employment share and noted:

We find that the sector employs considerably fewer apprentices than would be expected from its share of trade employment. In fact the sector would have to double its number of apprentices to be on par with other industries.

Karmel and Mlotkowski, 2010: p. 7

6.4 Higher education

6.4.1 Higher education supply

The resources sector employs people with higher education qualifications in the specialised fields of engineering—mining, petroleum, chemical, environmental and civil—and geoscience—geology, geophysics and geochemistry—as well as accountants, planners, auditors and others. In recent years there has been much concern about the lack of graduates in engineering in particular.

Student commencements in engineering

The latest higher education data is for 2008. Over the period 2002–2008, the number of students commencing in engineering courses was at its lowest point in 2005 but since then numbers have been increasing. Between 2005 and 2008, the number of domestic students commencing in undergraduate engineering courses increased by 16 per cent, from 10,619 to 12,321. In 2008, just over one in four students commencing in undergraduate engineering courses were overseas students and just over one in two students commencing postgraduate courses were overseas students.

Student commencements in geoscience

Over the period 2002–2008, the number of students commencing in geoscience courses was at its lowest point in 2005 and has since increased, but commencement numbers in 2008 were well below those seen between 2002 and 2004. Between 2005 and 2008, the number of domestic students commencing in undergraduate geoscience (or earth science) courses increased by 34 per cent, from 171 to 229. In 2008, just over one in five students commencing undergraduate geoscience courses were overseas students and just over one in three commencing postgraduate geoscience courses were overseas students.

6.4.2 Projected trends in higher education domestic undergraduate completions

DEEWR has modelled projected completions for domestic undergraduate students in the period 2008 to 2014 based on recent trends in commencements and historical completion rates for particular courses. Graduates who complete in 2014 are likely to enter the occupation in 2015.

Engineering

Across all engineering fields, the number of completions for domestic students from undergraduate courses are projected to grow by 11.2 per cent from 6,312 in 2008 to 7,020 in 2014. Table 12 provides estimates of the total number of tradespeople by occupational group in 2010 and in 2015 and includes information about the increase or decrease. For example the number of electricians is expected to increase by around 22,000 (17 per cent) by 2015 under the average case scenario. Table 13 shows the distribution across states and territories.

Table 12: Number of completions and projected completions in higher education, domestic undergraduate courses, for engineering fields, 2008 and 2014

Occupation	2008	2014	Growth %
Mining engineering	139	253	82
Chemical engineering	347	443	28
Civil engineering	935	1,107	18
Maritime engineering and technology	76	104	37

Source: DEEWR analysis of Higher Education Student Data, DEEWR, 2010, unpublished

Table 13: Number of completions and projected completions in higher education, domestic undergraduate courses for engineering¹, states and territories, 2008 and 2014

State/territory	2008	2014	Growth %
Western Australia	715	1,017	42
Queensland	1,142	1,598	40
New South Wales	1,676	1,993	19
South Australia	427	467	9
Tasmania	134	178	32
Northern Territory	11	15	37
Victoria	2,106	1,692	-20
Australian Capital Territory ²	101	58	-42

Source: DEEWR analysis of Higher Education Student Data, DEEWR, 2010, unpublished

Notes:

¹ 'Engineering' includes Australian Standard Classification of Education (ASCED) codes: 030000–039999

² From 2005 completions from the Australian Defence Force Academy are included with NSW—prior to 2005 they are included with the Australian Capital Territory

Geoscience

Based on recent trends, domestic undergraduate completions in geoscience are expected to decrease from 138 in 2008 to 112 in 2014.

6.4.3 Employment destinations for higher education graduates

Graduate Careers Australia found 90.6 per cent of the mining engineering graduates who completed their qualifications at the end of 2008 were working in a mining-related occupation four months later, and 81.4 per cent of geology graduates were working in occupations directly related to their degrees. Table 14 provides data on whether graduates were working in a field related to their training.

Table 14: Proportion of graduates working in areas related to training by field of study, 2008

Broad field of education	Proportion of bachelor degree graduates working in areas related to training (%)
Chemical engineering	90.6
Civil engineering	85.7
Electrical engineering	85.2
Electronic/computer engineering	80.6
Mechanical engineering	84.9
Mining engineering	90.6
Other engineering	81.8
Geology	81.4
Chemistry	83.9
Physics	66.1

Source: Graduate Careers Australia, 2009

However, the Taskforce's analysis of census data indicates many mining professionals are employed in other industries. See Table 15.

Table 15: Number and percentage of those with mining engineering and geoscience qualifications working in mining, 2006

Field of education	Total employed	Number employed in mining (ANZSIC 2006)	Proportion working in mining (%)
Mining engineering	7,429	4,068	55
Geology	9,247	3,146	34
Geophysics	1,034	305	29
Geochemistry	139	14	10

Source: Taskforce analysis of ABS, 2007

6.4.4 Immigration

Temporary and permanent skilled migration has made a significant contribution to the supply of skills to the resources sector.

This has occurred directly through employer-sponsored programs and through the General Skills Stream of the Permanent Migration Program which creates an onshore pool of skills from which the resources sector can draw.

These have been supplemented by temporary programs such as the Subclass 457 visa and labour agreements with the Australian Government. A number of agreements are negotiated with labour hire companies supplying skilled workers to the resources sector.

In 2008–2009 employers in the mining sector were granted 4,300 Subclass 457 visas (8.5 per cent of all granted). This was down 11.9 per cent from the previous year. Employers in the construction sector were granted 5,540 visa applications (10.9 per cent of all granted). This was a decrease of 2.6 per cent from the previous year.

Recent trends indicate that Subclass 457 visa applications are increasing as the economy recovers.

7. Where are the skills gaps?

This chapter examines:

- recent labour market trends
- competition for skills sought by the construction and resources sectors
- existing skills shortages across the economy.

The economy continues to strengthen following the global recession, although recovery is geographically patchy.

Economic growth is expected to continue to strengthen over the next two to three years. Employment has risen for eight consecutive months to April 2010 and seems likely to continue to rise (Australian Treasury, 2010). Job vacancies are increasing, especially in engineering and trades for the resources sector, but there is currently no shortage of applicants for entry-level positions.

There is significant potential for skills gaps to emerge between 2011 and 2013 as construction of new resources projects commences.

Shortages are likely to peak in 2012 and 2013 because of the expected peak in construction of major infrastructure projects.

Current skills shortages exist for:

- civil, electrical, mechanical, mining and petroleum engineers
- carpenters
- plumbers
- automotive trades.

In South Australia, Western Australia and the Northern Territory there are shortages of welders. In Western Australia, there is a shortage of earthmoving plant operators, motor mechanics, carpenters and joiners and concreters. Looking ahead, Western Australia is likely to face increasing shortages of these skills, as well as shortages of structural steel and welding trades workers, fitters and electricians, structural steel concrete workers and crane lift and hoist operators.

In Queensland, shortages will depend on the progress of CSG/LNG projects but are likely to include mining production managers, civil, electrical, mechanical and petroleum engineers. There could also be shortages of fitters, electricians and electrical instrumentation workers, drillers and plant and machinery operators. Skills shortages will be more significant in regions where resources projects are concentrated.

7.1 Competition for skills and labour from other industries

Stronger economic growth is likely to result in reduced unemployment. This will lead to greater competition for scarce skills between employers (RBA 2010: p. 3).

The DEEWR Skilled Vacancy Index (SVI) (trend) was 18.6 per cent higher in April 2010 than the year before.

Over the year to April 2010, increases in skilled vacancies were recorded for all but one of the states and territories. The largest increases were recorded for Western Australia (73.9 per cent) and the Northern Territory (26.9 per cent). Queensland vacancies fell by 40.3 per cent.

There were strong increases in vacancies for:

- building and engineering professionals—up 47 per cent
- metal trades—up 118 per cent
- construction trades—up 84 per cent
- wood trades—up 74 per cent
- electrical and electronic trades—up 43 per cent.

However, wages growth is relatively subdued, including in the mining sector. This suggests skills shortages have yet to add significantly to wage pressures in the resources sector, as they did in previous economic cycles.

7.2 Supply gaps

7.2.1 Trades

The Taskforce estimates the number of new trade positions required as a result of expansion in the mining and gas sectors will be around 16,000 and replacement demand will be about 4,400 per annum, that is 22,000 over 2010–2015.

Assuming 39,000 short-term trades jobs are to be created during construction and each will last an average of 12 months, around 7,800 tradespeople will be required in total over the five year period. If the resources sector continues to recruit 5.6 per cent of anticipated completions each year until 2015 (around 10,000 tradespeople) there will be a shortfall of around 35,800 tradespeople. See Table 16.

Table 16: Projected supply of trades versus projected new and replacement jobs

	Number of new jobs for tradespeople 2010 to 2015	Total new jobs for tradespeople (construction, mining and gas operations)	Jobs as a result of attrition (mining and gas)	Supply of tradespeople (construction, mining and gas operations)	Projected shortfall of tradespeople
Construction	7,800				
Mining operations	15,000	23,800	22,000	10,000	35,800
Gas operations	1,000				

Source: Taskforce estimates based on Karmel and Mlotkowski, 2010 and ABS 2008b

Note: Estimates include construction, mining and gas operations except in the column estimating 'jobs as a result of attrition'—here construction has been excluded because it is difficult to estimate the attrition rate for construction jobs in the resources sector and the jobs are short-term project positions.

7.2.2 Engineers

Taskforce estimates suggest the resources sector will not face absolute shortfalls in the supply of engineers. However, the sector will need to more than double its intake of graduates to meet its skills needs, which could leave other sectors with shortages.

Table 17 provides projections of supply to the resources sector compared to projected new jobs for engineers and losses to attrition over the period to 2015.

Table 17: Projected supply of engineers versus projected new and replacement jobs

	Number of new jobs for engineers 2010 to 2015	Total new jobs for engineers (construction, mining, and gas)	Jobs as a result of attrition (mining and gas)	Supply of engineers (new graduates)	Projected shortfall of engineers
Construction	780				
Mining operations	3,205	4,385	2,100	40,000	NO SHORTFALL
Gas operations	400				

Source: Taskforce estimates based on ABS 2008 and Higher Education Student Data 2010

Notes: Assumes employment share for engineers in resources remains constant over projection period compared to base period. Attrition estimates based on analysis of ABS Occupational Mobility Survey. Estimates include construction, mining and gas operations except in the column estimating 'jobs as a result of attrition'. Construction has been excluded because it is difficult to estimate the attrition rate for construction jobs in the resources sector and the jobs are short-term project positions.

7.2.3 Mining engineers (includes petroleum engineers)

Mining engineers account for around 40 per cent of all engineers in the mining sector (i.e. around 4,900). For the period 2010–2015, Taskforce modelling suggests there will be 1,600 new jobs for engineers and 1,300 due to replacement demand (estimated at 260 per annum—around 5.3 per cent). The sector could, therefore, be looking to recruit 2,900 mining engineers. The supply from new graduates should be around 1,200 so unless the sector can reduce attrition and attract engineers working in other industries, there could be a shortfall of 1,700 mining engineers.

7.2.4 Geoscientists

Around 3,400 people are employed as geoscientists in the mining sector. For the period 2010–2015, Taskforce modelling suggests there will be 2,200 new jobs for geoscientists and 1,650 due to replacement demand (estimated at 330 per annum—around 9.7 per cent). The sector could, therefore, be looking to recruit 3,850 geoscientists. The supply from new graduates should be around 800 leaving a potential shortfall of around 3,000. However, as approximately 70 per cent of people with geoscience qualifications work outside the mining sector, there may be scope for companies to recruit these people.

7.3 Competing demands for construction

The resources sector competes with infrastructure projects for skilled construction labour but there should be limited competition for the next 12 to 18 months.

While strong growth in business investment is anticipated in 2010–2011, investment in non-residential building is expected to remain subdued. Outside of stimulus-related activity, there is a limited pipeline of work in the building sector reflecting credit constraints, high vacancy rates and soft property prices. Despite support from the Government's stimulus program, investment in this sector has fallen sharply over the past year. This weakness is expected to continue into 2010–2011 with investment forecast to fall by a further 6.5 per cent.

As commercial property vacancy rates stabilise and previously built floor space is absorbed through the broader economic recovery, building approvals are expected to recover during 2011, leading to renewed activity in the sector. This is expected to lead to a modest recovery in investment in 2011–2012, with growth of 4 per cent (Australian Treasury, 2010: pp. 2–21).

Over the next two years over \$70 billion worth of major, non-resources infrastructure projects will be sanctioned. Across Australia the types of construction projects include rail, road, port, hospitals and sporting complexes.

7.4 Addressing skills gaps

As the economy strengthens, employers will need strategies to attract and retain labour. While higher wages have attracted many to the sector, employees are also interested in other conditions including access to training, career progression and a family-friendly work environment.

Increasing competition for graduates and skilled workers highlights the importance of attraction and retention strategies. The probability of job separation from the mining sector is relatively high compared to other industries and anecdotal advice to the Taskforce suggests turnover is higher for FIFO workers. This suggests employers need to be innovative in sourcing local labour where available and finding ways to reduce skills attrition (Shah and Burke, 2004).

Construction skills shortages in Western Australia and regional Queensland have been addressed by a FIFO/DIDO workforce for many years. Further growth in FIFO numbers seems likely with the expansion of resources sector activity. The use of FIFO has been facilitated by increases in flights from other centres, including direct flights from Brisbane, Melbourne and Sydney to Karratha and other northern ports. For communities with above-average unemployment rates, such as Cairns, FIFO jobs can present important employment opportunities in both construction and operations of new resources developments.

7.4.1 Trades

Apart from attracting tradespeople from other industries, the main short-term options for increasing supply of skills include recruiting from the unemployed and through temporary or permanent migration. In the longer term, the resources sector should consider increasing its training activities. Adult apprenticeships are an option given the sector's reluctance to employ young people. Again, FIFO can play a role in meeting skills needs, particularly through recruitment from areas with high unemployment.

7.4.2 Professions

In the short term, apart from attracting professionals from other industries, the main options appear to be:

- recruiting from the unemployed
- increasing the number of students completing relevant degrees at university
- increasing the sector's recruitment of graduates
- utilising temporary or permanent migration.

In the longer term, the sector should promote resources sector career paths to prospective students and work with universities to ensure increased demand for places can be met.

7.4.3 Other

Demand for labour in some of the less skilled occupations can be addressed by recruiting workers from other industries and unemployed people, and providing appropriate skills training.

8. Impact on other industries and locations

This chapter explores the impact resources projects could have on other industries and locations, including those close to resources projects and some a distance away.

Illustrative examples of the types of effects on labour markets that have been reported to the Taskforce include:

- a sharp increase in resources sector employment in the Pilbara and Bowen Basin, drawing labour from jobs in nearby towns and creating high demand for workers in service industries in the regions
- Brisbane-based workers taking advantage of higher paying job opportunities by commuting through FIFO and DIDO to the Bowen Basin
- workers from a range of industries in Perth accepting FIFO/DIDO jobs in northern Western Australia to drive heavy vehicles, cook and clean.

8.1 Labour mobility

Movement between industries, locations and occupations are typical in the labour market. Around 12 per cent of the total Australian workforce in February 2008 had changed their employer or business in the previous twelve months (ABS, 2008b). Of these, 30 per cent had changed industry and 24 per cent had changed occupation.

These dynamics create opportunities for job seekers, but demand in rapidly expanding industries creates labour and skills deficits in other sectors and locations.

While the resources sector is only 1.6 per cent of Australia's total employment and 1.8 per cent in Queensland, this rises to 6.2 per cent in Western Australia (ABS, 2010f). So it is not surprising that Perth is more affected by changes in demand for workers in the resources sector than other cities. An estimated 22,000 job vacancies were recorded in April 2010 in Western Australia, many in occupations relevant to the resources sector, such as technicians and trades workers, machinery operators and drivers and labourers (DEEWR, 2010c).

8.2 Possible strategies

Previous experience of significant growth in the resources sector and the attendant tightening of labour markets suggests people should be able to anticipate and prepare for the labour and skills shortages likely to emerge.

As skills shortages increase in other industries and metropolitan locations, there will be more opportunities for a decreasing number of unemployed people. This provides an opportunity to reduce the number of people reliant on working age, income support payments.

Strategies for addressing skills shortages in non-resources sector industries include:

- matching suitably skilled job seekers with existing and emerging vacancies using employment services providers to find sustainable work in occupations with skills shortages and the New Enterprise Incentive Scheme to support job seekers to develop and sustain their own businesses
- clarifying non-resources sectors employers' requirements of their potential workforce

- for employment services providers, training organisations and job seekers
- preparing job seekers for future vacancies, which might require numeracy and literacy and skills training
 - increasing labour force participation by reconnecting with people who have left the labour force by delivering job expos and career information services
 - introducing workforce development strategies including innovations in job design to suit people who are returning to the workforce and to retain older workers, including in part-time roles
 - regional coordination between employers, training organisations and employment services providers to increase employment opportunities for local people and better meet the needs of employers—a strong theme in submissions to the Taskforce.

The Taskforce received few submissions recommending that job seekers relocate to find work in remote locations. Companies already assist skilled people to relocate.

The Taskforce appreciates it is easier for skilled workers to relocate than unemployed job seekers without relevant skills and with limited means. The cost of housing in resource communities like Karratha and cities like Darwin and Perth is particularly prohibitive for those re-entering the workforce. Previous efforts to encourage people to relocate have met with mixed results. The Australian Government undertook pilot projects between 2006 and 2008, which provided additional assistance for unemployed job seekers who were willing to relocate from parts of regional New South Wales and northern Adelaide for specific jobs in stronger labour markets, especially Perth. The take-up of relocation assistance was low, although there were some successful employment outcomes.

PART B

WORKFORCE DEVELOPMENT PLAN

9. Strategies to increase the supply of skills

The terms of reference required the Taskforce to 'develop a comprehensive workforce development plan taking into account the planned major resources, energy and related infrastructure projects in Australia and their employment and skills requirements'.

Much of the sector's skills needs will be met by the operation of market forces, but market forces alone will be insufficient. Shortfalls will remain, especially for tradespeople, engineers and geoscientists. The 'pull effect' of higher wages and salaries paid to resources and construction workers will produce labour shortages and wage pressures elsewhere, from regional centres to Perth, Darwin and beyond.

The following chapters outline the Taskforce's suggested approach to addressing these issues over the next five years.

In summary, the Taskforce advocates:

- a new partnership approach to workforce development through workforce planning at the company and regional level
- greater sharing of information to inform the development of policies and strategies to help meet the sector's needs
- increased emphasis on training as a means of addressing companies' current and future skills needs
- more help for companies to meet regulatory requirements
- targeted measures to improve the supply of labour including:
 - increase the supply of specialist trade and professional skills
 - make better use of temporary migration for short-term skills shortages
 - define clearer pathways for new entrants
 - connect unemployed job seekers (with training if required) to jobs including through FIFO/DIDO
 - increase the participation of women and Indigenous people
- urgent attention to the housing and infrastructure needs of resources sector communities.

10. A new partnership approach

This chapter recommends a new partnership approach to workforce planning.

The resources sector is highly competitive, especially when it comes to skills. Until now, companies have resolved their labour needs by outbidding each other in the market place. This works when the supply of labour is adequate. Now, with more projects than ever before and emerging shortages, strategic planning and cooperation are a rational response. These will return benefits to the sector and to regional economies.

10.1 Workforce planning

The case for better workforce planning can be made on three levels:

- Companies need to better understand their own labour and skills requirements, taking into account all the relevant factors such as employee turnover, an ageing workforce, changes in technology, and the need to identify ways to meet those requirements.
- Stakeholders at the local and regional level need to understand the impact of resources projects on local employment markets and infrastructure adequacy.
- There is a need to understand the impact of the resources sector on employment levels and infrastructure usage, to inform policies in employment, education and training, and infrastructure.

The Taskforce has found many companies reluctant to offer information about their future workforce needs. It is understandable some may be concerned that sharing such information may reveal investment intentions. The use of contractors also makes information gathering difficult.

Some companies undertake workforce planning on a regular basis. In their submissions, ConocoPhillips says it undertakes workforce planning each year with a ten-year horizon and Rio Tinto indicates it has a five-year horizon.

At its simplest, workforce planning is about getting the right people with the right skills in the right place at the right time. But in the face of tightening labour markets, skills shortages and an ageing population, longer-term planning can provide significant strategic advantages:

...workforce planning will become a necessary activity for many businesses as relatively fewer new entrants to the labour market mean an organisation cannot simply rely on sufficient people 'being there' in the future.

Chamber of Commerce and Industry Western Australia

Ensuring that the (CSG/LNG) industry has ready access to a workforce with the requisite skills to deliver the proposed projects is vital to its success. Workforce planning will require a coordinated effort involving industry, all levels of government, and education and training providers.

Australia Pacific LNG submission

A number of organisations currently exist to help companies identify their workforce development and skills needs. These include SkillsDMC, Enterprise Connect, state and territory government industry skills bodies such as the Western Australian Resources Industry Training Council (RITC), Energy Skills Queensland, and numerous private sector businesses. A number of

submissions made positive comments about the work being done by SkillsDMC to assist mine sites with workforce development plans.

The lack of reliable workforce data currently forces resources industry bodies to conduct their own surveys. The South Australian Chamber of Minerals and Energy and the Queensland CSG/LNG industry have recently conducted major studies into the future workforce needs of their states. State governments also struggle to gather sufficient information. In recent times the Australian Government has sought to fill this gap through DEEWR's and Skills Australia's regular publications, which draw upon data gathered by industry skills councils, the Australian Bureau of Statistics (ABS), industry surveys and economic modelling.

This is repetitive and administratively burdensome for companies, and provides data of sometimes limited reliability. A number of submissions to the Taskforce identified this as a major problem. The National Employment Services Association's (NESA) response was typical:

We consider that the different approaches adopted by stakeholders such as Commonwealth and state governments, industry skills councils, industry and business groups weakens capacity to aggregate, compare and accurately analyse data. Reliable and holistic data is imperative to plan skills development activity to meet anticipated demand.

NESA submission

Overall, the submissions provide support for a more comprehensive approach to workforce planning, calling for greater aggregation and sharing of information, particularly to assist the efficient operation of a national training system:

...it is our view that the resources sector, major suppliers to this sector, each appropriate tier of government and industry associations all have a part to play in the reporting of projects in terms of timing, existing skills within their organisations and existing and forecast skills gaps.

Chandler MacLeod submission

Some suggested this could involve the creation of a new body. The Australian Council of Trade Unions (ACTU) proposes the establishment of a tripartite body charged with workforce planning responsibilities. In their combined submission, the Minerals Council of Australia (MCA), Queensland Resources Council (QRC) and Chamber of Minerals and Energy of Western Australia (CMEWA) suggest a model based on the industry-driven Queensland Skills Commission. Others suggest Skills Australia should fulfil this role.

The Taskforce commends those state governments that have established agencies to drive workforce planning and development, including Queensland and Western Australia.

The Taskforce considers it would be appropriate to require companies to provide workforce planning information as part of the regulatory approval process at the state and territory level. This is recommended as an information requirement and not a further approval requirement.

The use of a nationwide template for this purpose would produce consistent national data suitable for strategic planning purposes. The required information could include:

- the estimated total workforce required by the company and its contractors for both the construction phase and ongoing operations
- a breakdown of the major occupational groupings required

- a plan of how the company intends to recruit labour, including
 - intended use of temporary or permanent migration
 - outsourcing arrangements
 - opportunities for local people, including Indigenous people.

Industry and government would need to agree confidentiality protocols.

RECOMMENDATION 1.1

That resources companies be required to provide a workforce impact statement using a standard template to outline the workforce needs of projects (\$40 million+) at the same time as they apply to the relevant state or territory government for project approval. Companies should then provide the relevant state or territory government with more detailed workforce information at the time of the Final Investment Decision, prior to the construction of the project and before the project commences operations. This information should include proposed sources of labour and training plans. This approach should be trialled in Queensland, Western Australia and one other state with a view to being implemented nationally from 1 January 2012. This is recommended as an information requirement, not a further approval requirement.

10.2 Regional workforce plans

The provision of workforce planning data would afford state government and regional authorities the opportunity to develop their own plans to take advantage of the economic opportunities presented by projects and to reduce negative impacts on local industries and the community:

...a regional development focus also fits with the workforce development agenda being advanced by Skills Australia... There is an opportunity through this Taskforce to garner ongoing support for coordinated regional level initiatives to deal with the collective skills and workforce challenges across different industries in mining regions, rather than dealing with issues project by project.

ACTU submission

Such plans would need to be developed by people with appropriate expertise and with input from relevant stakeholders. They could identify the number and types of jobs likely to become available in the construction and ongoing operations phases and articulate arrangements to maximise opportunities for local people. For example, they could outline plans to increase the total number of trade apprentices in the region and to work with schools so students and their parents understand future job opportunities.

Plans could also identify occupations and industries that might lose workers to the construction and/or resources operations, together with strategies to ensure job seekers and those not currently in the workforce obtain the skills and attributes needed by the sector and by industries likely to lose workers to the resources sector. This could include employment services providers working with registered training organisations to provide job seekers with numeracy and literacy education, skills training and work experience.

Regional workforce plans could also take account of broader issues, such as housing and land release, and the need for hard and soft infrastructure.

Regions in Western Australia and Queensland are increasingly responding to the need for a coordinated approach to managing the impacts of major resources projects. Queensland's Surat Basin Future Directions Statement is a good example.

RECOMMENDATION 1.2

That regional development organisations lead the development of regional workforce plans that include strategies to manage the impacts of major resources projects on the community and maximise opportunities for local people. Resources companies, education and employment organisations, relevant local, state and Australian government departments could be consulted in the development of such plans. A 'region' should be as defined by the state or territory government.

10.3 Sharing information across jurisdictions

The Taskforce considers there is a need to raise awareness of the workforce requirements of the resources sector across all areas of government. To achieve this, the Taskforce recommends that Skills Australia should report to the relevant ministerial councils for resources—the Ministerial Council for Mineral and Petroleum Resources (MCMPR) and the Ministerial Council on Energy (MCE)—on the status of skills in the resources sector. Skills Australia should also report to the Ministerial Council for Tertiary Education and Employment (MCTEE) in relation to skills that require tertiary qualifications.

RECOMMENDATION 1.3

That Skills Australia report annually through the Ministerial Council for Tertiary Education and Employment to the Ministerial Council for Mineral and Petroleum Resources and the Ministerial Council on Energy on the status of skills shortages in the resources sector.

10.4 Workforce development

Planning, training and workforce development should be the sector's number one response to addressing current and future skills needs. In their joint submission to the Taskforce, the Minerals Council of Australia, the Chamber of Minerals and Energy, Western Australia and the Queensland Resources Council suggest:

The business case for enterprises' investment in training is to increase productivity.

MCA, CMEWA and QRC submission

The resources sector has embraced a safety culture. Safety is an integral part of the business focus of all leaders and managers who own safety in their organisations and drive the safety culture. Leaders can clearly articulate their safety strategy, safety statistics and what they are doing to continue to focus on safety improvements.

The sector has the means to adopt the same model to achieve a skills training culture. By mapping out their future skills needs and making a considered investment in the skills of existing and prospective workers, companies can position themselves to succeed in tightening labour markets.

The Taskforce urges companies to place a very high priority on training as a means of meeting their current and future skills needs and improving productivity.

RECOMMENDATION 1.4

That resources and construction companies place a very high priority on training as a means of addressing their current and future skills needs and consider adopting a training culture similar to their approach to safety.

10.5 More help to negotiate the system

During consultations, the Taskforce was told it was easier to do business in South Australia than in other states. The MCA confirms that companies find South Australia the best state to deal with.

The Government of South Australia provides a 'case manager' to assist companies with complex and significant projects. Case managers are senior, experienced government employees responsible for providing a single point of contact to project proponents for all of their government interface requirements. The MCA notes it is the appointment of a 'senior' public servant that makes the difference.

The case management approach ensures companies' interactions with the government are efficient and effective. The Government of South Australia advises that two of their newest mines, Prominent Hill copper-gold mine and Jacinth/Ambrosia zircon mine, achieved all of the necessary permits in under six months.

The Government of Western Australia's new approvals process also appoints a senior project manager to facilitate the approval process. The Queensland Government provides a similar service to the CSG/LNG industry. It would be helpful to companies if state government approaches were consistent.

The Australian Government Major Project Facilitation Program provides assistance to project proponents by helping coordinate Australian Government approvals processes with relevant state and territory government processes. This is done through liaison with Australian Government and state and territory industry development and investment bodies. While the program is not specifically designed to support major projects in the resources sector, 11 of the 20 projects with Major Project Facilitation status are in the resources sector.

On 28 May 2010, the Ministerial Council for Mineral and Petroleum Resources (MCMPR) agreed mining approvals reform should be taken into consideration to enhance regulatory transparency and reduce the compliance burden in the context of efforts to improve land access arrangements. During consultations on land access arrangements, industry has indicated support for a 'one stop shop' to reduce compliance burdens.

RECOMMENDATION 1.5

That state and territory governments consider adopting a case management approach, such as that provided in South Australia, which involves the appointment of a senior, experienced government employee to provide companies with a single point of contact for all of their government approvals and regulatory requirements, including workforce planning.

11. Increase the supply of trade professionals

This chapter offers strategies to increase the number of skilled tradespeople in the short, medium and longer term.

DEEWR SkillsInfo data indicates that about 40 per cent of construction workers and 35 per cent of resources sector employees do not have formal qualifications (DEEWR, 2010d). Many of these people have excellent skills and with assistance could become qualified tradespeople in minimum time.

11.1 Apprenticeships

The Australian Apprenticeship⁴ system is the primary means of supplying trade qualified people to the construction and resources sectors.

Nearly a third of submissions addressed issues relating to apprentices and the apprenticeship system. These included the need for:

- strategies to attract and retain apprentices
- adequate training, supervision and mentoring
- more responsive and flexible apprenticeship arrangements for employers and apprentices—especially for FIFO apprentices.

Over the past few years, employers, unions, training providers and governments have all called for an improvement in apprenticeship training in Australia. The apprenticeship model can be an outstandingly effective form of vocational training (OECD, in press). However, it needs to be revitalised, adapted and strengthened to better address the expectations of employers and young and mature apprentices:

The traditional model of apprenticeship is under pressure. For some time we have seen high non-completion rates across states, difficulties in attracting new apprentices in areas of major skills shortages and debates about the need for alternative models, including more accelerated forms of apprenticeships for Australian industries.

Callan 2008

Clearly there is an imperative to increase the number of new entrants to trade occupations through the apprenticeship system and lift completion rates. Completion rates in 2008 for apprentices who commenced in the 2003 cohort varied from 44.7 per cent for construction trades workers to 55.1 per cent for electrotechnology and telecommunications trades workers (NCVER, 2009).

Opportunities to promote and build on good practices already supporting the apprenticeship system are to be encouraged. Several examples were provided of good practice between employers and registered training organisations (RTOs) including accelerated learning, customisation of training pathways and qualifications and innovative flexible delivery.

⁴ Australian Apprenticeships (apprenticeships and traineeships) combine paid work and structured competency-based training, which can occur on and/or off-the-job, which leads to the attainment of a nationally recognised qualification. An Australian Apprenticeship is first and foremost an employment relationship between apprentice and employer, underpinned by a contract of training.

There was a consistent argument in submissions to the Taskforce to upskill adult workers. This should include improved recognition of prior learning (RPL) or recognition of current competencies (RCC) with gap training where required.

Several submissions raised the need for more flexible apprenticeships including the capacity for apprenticeships to be accelerated.

Xstrata (Coal)

Xstrata (Coal) has embraced the need for more flexible training delivery pathways for its apprentices. While the traditional apprenticeship pathway involves integrated on and off the job training, Xstrata has worked with the Queensland Government to modify the deliver methodologies to fast-track individuals through their training.

Under the initiative, apprentices undertake institutional training for nine months in the first year of their apprenticeship. During this period, apprentices also undertake additional competencies in first aid, forklift operations, elevated work platform, welding and crane basics, as well as on-site experience.

Through this initiative, apprentices have the potential to complete their apprenticeship in two to three years.

A number of submissions raised the need for the training system to be more responsive to the needs of the sector. For example the Resources Industry Training Council's (Western Australia) submission articulated many of the views provided through submissions and consultations:

Industry demands a system that is responsive and provides relevant training at a time and place and in a manner that contributes most to productivity. Too long have training providers scheduled training to suit their needs rather than the operational needs of employers. Course content is often dictated by the training provider and not adapted to suit the workplace... Trade training is particularly trying with many block release classes being fitted around the institution rather than operational needs...

A new approach is required to enhance the training of apprentices, particularly at FIFO sites. The old model of mobile training should be reconsidered with training occurring either onsite or at a facility near the operations so apprentices from neighbouring sites can also attend.

Resources Industry Training Council submission

The Taskforce is mindful of a range of initiatives in train with the Council of Australian Governments (COAG), and state authorities to support apprentices and employers, and improve the apprenticeships systems. Many measures that have been recommended by the COAG Apprenticeships Taskforce are 'sensible and overdue'. Some of these include:

- developing and implementing a better apprenticeship access, re-entry, deferral and support system
- developing and introducing a reformed pre-apprenticeship system
- strengthening mentoring and support for out-of-trade apprentices and those at risk of losing their apprenticeships
- facilitating arrangements for effective implementation of competency-based progression and completion for apprentices.

DEEWR should host a roundtable of key sector representatives, including industry, unions, training providers, state and territory governments, national and state-based industry skills councils and other bodies and industry associations, to discuss possible models to be trialled in the resources sector. These could include:

- smarter apprenticeships pilots—of accelerated competency-based training
- onsite training centres with trainers based in the workplace
- group training organisation (GTO) pilots—GTOs with good retention rates become ‘incubators’ for the first two years of an apprenticeship then release apprentices for permanent positions with resources and construction companies
- ‘incubator’ pilots under a commercial arrangement between two companies—a resources or construction company enters into a commercial arrangement with an appropriate company to train apprentices in a specific trade.

There was also support in submissions for trialling combined institutional and workplace pathways to trades qualifications. The Taskforce believes this model should be considered in the context of the COAG apprenticeship reforms.

Companies can take advantage of upskilling existing workers in the construction and resources sectors. Some already do, including by flying trainers to work sites or with mobile training facilities. The Taskforce commends companies like Aditya Birla, which has made a strong commitment to investing in the skills of its workers.

Aditya Birla Minerals—Australian Apprenticeships pathways

Aditya Birla Minerals, predominantly a copper mining company, has a workforce of over 500, mainly professionals and tradespeople in Western Australia and Queensland.

In December 2008, MEGT Australian Apprenticeships Centre met with Aditya Birla Minerals and Richards Mining Services (a RTO) to discuss training needs at Birla Nifty Copper Mine, located in the Great Sandy Desert, Western Australia.

Traditionally, training provided to employees at Aditya Birla Minerals was seen as site specific and not aligned to national training system competencies. There was little information available on how to upskill onsite employees through Australian Apprenticeships pathways.

Aditya Birla Minerals saw the benefits of upskilling its workforce onsite and agreed to MEGT and Richards Mining Services working with them to achieve this. MEGT interviewed each employee and observed them on the job.

MEGT submitted an ‘existing worker’ application to the former WA Department of Education and Training, now the WA Department of Training and Workforce Development. Through this, Challenger Institute of Technology was engaged to deliver training for higher-level traineeships in Certificate IVs and Diplomas in fabrication, electrical and mechanical engineering. One hundred and eighty-two employees were then able to be signed into National Training Contracts as trainees and apprentices. All new workers at the Aditya Birla mine site now start some form of traineeship.

Richard Mining Services has five qualified onsite trainers located at the Birla Nifty site. Ongoing support is provided to Aditya Birla Minerals' trainees and apprentices through MEGT, Richards Mining Services and Challenger Institute of Technology. All training providers visit the site regularly to ensure quality training is being provided.

Aditya Birla Minerals is dedicated to ensuring its entire workforce successfully obtains nationally recognised qualifications and has seen an increase in production levels, decrease in injury rate and significant improvement in staff morale.

Kumar Mangalam Birla, Chairman of the Aditya Birla Group said: 'I firmly believe that our people provide us with the cutting edge. For sustainable success, their performance orientation and customer focus is imperative. In my view, only where people grow, the organisation grows.'

RECOMMENDATION 2.1

That the resources sector significantly increase the number of apprentices it employs. The sector currently employs considerably fewer apprentices than would be expected given its share of trade employment.

RECOMMENDATION 2.2

That the Australian Government work with industry, unions, training providers, state and territory governments, industry skills councils, state skills bodies and industry associations to trial alternative apprenticeship models with a view to increasing the number of trade-qualified people in occupations and locations where a shortage is expected (e.g. electricians and welders). These could include any or all of the following:

- accelerated competency-based training with greater industry investment in workplace supervision and mentoring
- improved induction to apprenticeships through stronger pre-apprenticeships, including partnerships with Trade Training Centres
- the use of onsite and mobile training centres at mining sites
- companies entering into a commercial arrangement with other companies to train apprentices on their behalf
- apprentices commencing under group training organisation arrangements and transferring to a permanent employer in the resources or construction sector part way through their training.

RECOMMENDATION 2.3

That a program be developed in the Gladstone region as part of a coordinated workforce-development strategy to boost the number of apprentices, including in electrical trades, that will be in high demand in the liquefied natural gas, coal seam gas and construction industries. If successful, this approach could be replicated in other appropriate regions.

11.2 Recognition of prior learning and recognition of current competencies

Recognition of prior learning (RPL) is a formal process that allows people to have the skills and knowledge they have developed outside the formal education system assessed and valued against national qualifications (Hargreaves, 2006). RPL is an assessment of evidence of an individual's work history, including prior study and a practical assessment of competencies. Recognition of current competences (RCC) is a subset of RPL. RPL services are provided by qualified assessors who may be in workplaces, part of a RTO or a separate business.

Recognition of the skills acquired through non-formal learning is important because:

- Individuals gain a feeling of self-worth and confidence, which encourages them to continue to upgrade their skills and knowledge, often leading to formal qualifications and improved safety and employment outcomes (Smith and Clayton, 2009).
- People can complete training in less time and increase workplace productivity.
- It saves training costs, time and effort, meaning employers can have their workers on site for a greater amount of time.
- Individuals can correctly identify their existing competencies and identify the gap training and upskilling needed to obtain formal qualifications.
- It can help unemployed and other job seekers with significant experience to become 'job ready' in minimum time for vacancies coming up on major resources projects or in locations that lose tradespeople to the sector.

Clearly RPL has not been used as effectively as it could be. In 2008, only about 4.1 per cent of all training enrolments involved some form of prior learning recognition (Mather, 2010: p. 29.). The Taskforce was told:

- RPL is expensive
- engaging with the training system is more complex than it needs to be because of training jargon, difficulty completing forms and the evidence required
- accessing gap training for individuals is difficult
- a shortage of quality assessors is a systemic weakness.

A critical factor in achieving quality RPL/RCC is to have highly competent assessors and nationally consistent rigorous and transparent processes.

Resources Industry Training Council submission

As a result of a recent COAG project to streamline RPL processes and address barriers to the take up of RPL, state and territory training authorities are increasingly reporting significant improvements in the uptake of RPL but this data has not yet been fully captured in NCVER statistics. There are now many examples of good practice in relation to RPL and vocational education and training (VET) pathways. For example, Victoria's Skills Stores provide 13 'shop front' advisory and referral services. Skilling Solutions Queensland provides a face-to-face skills assessment, training and career information service across 27 shopfronts throughout Queensland. However, more could be done.

Energy Skills Solutions

Energy Skills Solutions provides advice on skills and training opportunities for career advancement in the Queensland energy industry, including:

- career advice on employment and workforce development opportunities
- skills evaluation to identify and match skills to qualifications
- referral advice to RTOs for skills assessment and recognition
- gap training advice on services provided by RTOs
- advice on regulatory requirements including licensing and permits.

Individuals eligible for funding may also receive reduced RPL assessment costs when enrolling in a qualification delivered by a RTO.

The program links in with Skilling Solutions Queensland activities, the Queensland Government's free training and career advice information service.

RECOMMENDATION 2.4

That relevant industry skills councils work with industry, education and training providers and unions to develop a model to assist people in the construction and resources sectors to achieve full trade status through better access to recognition of prior learning and recognition of current competencies and gap training (where required).

RECOMMENDATION 2.5

That industry place a priority on upskilling existing workers in the construction and resources sectors. As a first step the Australian Government should provide seed funding to relevant industry skills councils to develop workplace learning capacities on major projects.

RECOMMENDATION 2.6

That employment services providers work with unemployed tradespeople and technicians to gauge their interest in working in the resources or construction sectors, assess their skills and aptitude for employment in these sectors in conjunction with industry and facilitate any upskilling required to link them to a job.

RECOMMENDATION 2.7

That construction workers with significant experience but without trade qualifications who lose their jobs, be provided with recognition of prior learning and recognition of current competencies assessments, training needs analysis and gap training to assist them to achieve full trade status or an adult apprenticeship.

11.3 Trade trainers

Trainers are critical to preparing new generations of employees and play an important role in upskilling employees to fill different or more senior roles and increase their productivity.

The trainer workforce is ageing. This is an international trend with many countries now finding it difficult to 'compensate for the growing wave of retirements' (OECD, in press). The latest ABS figures for the VET workforce indicate that 38 per cent of VET practitioners were aged 45 to 64 in 2005 compared with 30 per cent in 1997 (ABS, 2005). In 2008, 48 per cent of the TAFE workforce was aged over 50 (Guthrie, 2010).

The labour market for trainers is already tight in Australia. VET institutions find it difficult to compete with industry for people with trade and training skills. This has the potential to get worse with the continued expansion of the resources sector.

What seems to be missing is a concerted effort to build workplace training capability at the enterprise level. Submissions to the Taskforce mostly supported improved workplace-based training:

- As many older workers in traditional trades approach retirement and look to 'down tools', there is an excellent opportunity to encourage them to impart their knowledge to new workers in a formal training environment or as part of a mentoring scheme.
- Shifting training out of TAFE and into the workplace would support enterprises to provide on-the-job training. This could be achieved by upskilling companies' existing workers so they can become qualified trainers and assessors.
- Work-based representatives could undertake skills analysis, mentoring and support to help employees identify and access appropriate training opportunities and RPL/RCC, offering a practical response to the lack of awareness that many employees report about their training options.
- Onsite trainers and assessors must be highly competent.
- Trainers and supervisors of apprentices and trainees in companies should have training appropriate to their role (OECD, in press).
- Retirement could be treated as a phased process, with older workers moving into part time roles in consultancy, quality assurance or mentoring. Workloads could be varied to accommodate semi-retirement and work need not be physically demanding.
- Encourage a diploma qualification including technical and theoretical (mathematics and physics) refreshers and the mentoring skills required to work with learners.

While it was suggested that people from industry could work in TAFEs and other RTOs on a secondment basis or as mentors, it was thought this may be an impractical measure in areas that are under immense pressure for skills.

The Gladstone Area Group Apprentices Ltd (GAGAL) has successfully targeted older employees who are nearing retirement or wanting to work part-time to become trainers and mentors.

Working with mature-age trainers in central Queensland

GAGAL is the largest employer of apprentices and trainees in the Central Queensland region. It is a not-for-profit, community-based GTO that facilitates the employment and training of apprentices and trainees. GAGAL currently employs over 450 apprentices and trainees and offers apprenticeship opportunities in 20 different trade classifications. GAGAL also offers school-based apprenticeships and traineeships that allow high school students to develop skills and acquire qualifications while continuing their secondary studies.

GAGAL's need for quality supervisors and trainers is met by attracting experienced tradespeople from industry. GAGAL suggests its success in recruiting and retaining is because it offers 'a good working environment, with flexible work hours and reasonably competitive wages'. Access to professional development is provided to obtain training qualifications for those who need them and are prepared to undertake the Certificate IV in Workplace Trainer and Assessor course and remain with the organisation.

Most importantly, the GAGAL executive recognises the value of the experience and expertise of older tradespeople who are willing to pass on their knowledge in the latter stage of their careers.

CEO Kerry Whitaker said: 'Tradespeople who are keen to contribute to the community in this way, approach GAGAL for employment opportunities. Sixty-five per cent of our supervisors and trainers are over 40 and 20 per cent are between the ages of 60 and 70. We believe GAGAL's reputation as a "good place to work" has resulted in our ability to recruit largely by word of mouth'.

RECOMMENDATION 2.8

That the Australian and state and territory governments work with industry and education and training providers to broker tradespeople with an interest and aptitude for training, assessing, mentoring and supervising into Certificate Level IV or Diploma in Training and Assessment, or other relevant vocational education and training qualifications.

12. Graduate more engineers and geoscientists

This chapter recommends measures to increase the number of people commencing and completing engineering and geoscience qualifications at university.

Universities make an important contribution to the supply of technical and professional skills for the resources and construction sectors, including engineers and scientists, as well as accountants, planners, human resources professionals, lawyers, managers and others.

Engineers and geoscientists are likely to be in shortest supply over the next five years, and those most sought after by the sector. The Taskforce is of the view that normal labour market forces should be sufficient to match demand and supply for other professional groups needed by the resources sector, particularly given the sector's capacity to offer competitive remuneration. Efforts therefore need to focus on increasing the number of engineering and geoscience graduates.

12.1 Increasing engineering and geoscience degree commencements

The Australian Government is currently implementing new funding arrangements for higher education, which will make it possible for universities to increase the number of students they enrol in engineering and geoscience, subject to operational constraints (DEEWR, 2009).

Universities have welcomed these changes but their submissions to the Taskforce raised a number of related issues. For example, the University of Western Australia has indicated a need to address the infrastructure requirements associated with an increase in student numbers:

Notwithstanding the introduction of new modes of course delivery, if the numbers of students in science and engineering are to be increased significantly there will need to be significant new investment in teaching infrastructure at UWA, especially in regard to laboratories and associated equipment.

University of Western Australia submission

The University of Queensland and MEA raised the issue of what happens in a demand-driven model of enrolments during a resources downturn:

Our concern is that the new demand-driven funding model proposed for universities will see tertiary minerals education programs starved for funds during commodity price cycle troughs. This is precisely the time that tertiary minerals programs require financial support from government sources. Failure to provide support over the down cycle may see some mining programs having to downsize staff numbers. This in turn will jeopardize the ability of Universities to encourage students into minerals programs once commodity prices rise and industry invariably begins to ramp up new projects and production.

MEA submission

In its submission, Universities Australia says it does not believe that demand-driven funding will be detrimental to the resources sector, 'provided that base funding levels for academic

disciplines are reviewed to ensure they are set appropriately, and mechanisms such as compacts can be used to support national priority disciplines’.

The Australian Government has already committed to an independent review of the base funding levels ‘to ensure that funding levels remain internationally competitive and appropriate for the (higher education) sector’ and to ‘examine options for achieving a more rational and consistent sharing of costs between students and across discipline clusters’(DEEWR, 2009). The review will report in 2011.

The sustainability of courses has been an issue for universities for a number of years, as indicated by the Australian Technology Network’s submission:

One challenge that universities face is the cyclical nature of the demand for graduates in the resources industry and the relatively small numbers of graduates training in certain specialisations—for example, Mining Engineering and Petroleum Engineering. This challenge is partially being addressed by use of partnerships with other universities to share courses using blended delivery, and to invest in technology such as advanced video conferencing to provide lectures and tutorials for students in widely dispersed locations across Australia. A limiting factor on such technology-intensive techniques, however, is the availability of infrastructure to do so. Additional investment in such areas would assist in expanding the education sector’s capacity to provide high quality delivery of this nature.

Australian Technology Network submission

The MEA partnership between the University of Queensland, the University of New South Wales, the University of Adelaide and the Western Australian School of Mines delivers a common curriculum to third and fourth year mining engineering students at these four universities. The MEA partner universities graduated 134 mining engineers in 2009, accounting for around 90 per cent of mining engineers who completed their studies in Australia that year.

The MEA partnership exemplifies the ‘centre of excellence’ model espoused by submissions as the solution to raising the profile and improving education and training in the resources sector, and it clearly enjoys success. This sort of partnership could be emulated for other disciplines to ensure the most effective use of teaching resources, including academic staff, and to enhance learning outcomes. The APPEA submission indicates this model is already under consideration for petroleum engineering.

The move to a demand driven system is timely because it means universities can respond to efforts to increase the number of students undertaking engineering, geoscience and related disciplines. Companies can work through schools, vocational education and training providers and higher education providers to promote pathways and opportunities in the resources sector, knowing those students who qualify who want to go to university will be able to get a place:

Creating aspirations at the school level for careers in resources companies will also be increasingly important under a system where student preferences drive allocation of university places.

Universities Australia submission

Companies will also be able to offer more scholarships to students. It is understood the resources sector already funds a significant number of scholarships for undergraduate and postgraduate students. The Taskforce heard there are more than 300 scholarships available in Queensland.

Companies will also need to do more to allay prospective students' fears about the boom-bust nature of the sector. For example, MEA partner universities all reported a decline in first year enrolments in 2010 following the global recession and the downturn in the mining sector in 2009.

Universities will be able to play their own part in generating demand for their courses, both in the interests of meeting the workforce needs of the Australian economy or particular industry sectors, and in the interests of optimising their business arrangements and ensuring their sustainability. This could extend to introducing or expanding initiatives to encourage people who may not have considered engineering or geoscience as an option or a possibility, such as people from low socioeconomic backgrounds and women or people with trade qualifications. If the sector aspires to employ more women, it needs to work with universities to increase the number of women undertaking tertiary study in relevant fields.

Women in engineering—University of Auckland

In 2006 the University of Auckland, through its Faculty of Engineering, commenced a 'Women in Engineering' Program. The program has succeeded in lifting the proportion of female engineering commencements from 20 per cent in 2006 to 25.4 per cent in 2010.

The program provides a range of services for prospective and current female students in engineering including:

- school and community visits to encourage and advise secondary school girls on the courses and career opportunities available
- annual Enginuity Days for Girls Only
- information, support and assistance in academic, personal and career issues for students
- advice to the faculty on how to attract and retain female students
- support for undergraduate and postgraduate women's networks in engineering.

Female engineering lecturers play a pivotal role as role models for young women at school to help identify future careers, and participation is mandatory for all faculty staff members.

The program has a five year horizon and reaches approximately 3,000 school girls each year.

As a result of the program, women are increasingly entering PhD programs (25 per cent of all PhD candidates are now women). Pass rates for women enrolled in the program are consistently 1–2 per cent higher than their male peers.

University efforts are complemented by other bodies, such as the Parker Centre, the Cooperative Research Centre for Integrated Hydrometallurgy Research and Development. In its submission to the Taskforce, the Parker Centre says that between 1993 and 2005 it produced 61 PhD Graduates. Over half of these people are now employed in metallurgy/hydrometallurgy operational or mining research positions. A further 30 per cent are employed in academia or

research organisations such as CSIRO. The Parker Centre is a good example of how partnerships between companies and educational institutions can be used to increase the quantity and quality of skilled graduates in the resources sector.

Universities need to consider new partnerships of this kind and flexible new ways of delivering their courses to prospective students, including those already working on resources projects.

RECOMMENDATION 3.1

That universities with a teaching profile that delivers professionals to the resources and construction sectors formalise and strengthen their ties with each other and industry, and articulate their role and strategic intentions in their mission statements.

12.1.1 Improving student retention through mentoring and internships

In addition to attracting new students, university engineering faculties need to improve their retention of existing students. Currently, 48 per cent of male and 40 per cent of female engineering undergraduates fail to graduate (King, 2008: p. 39).

A number of solutions to this high drop-out rate have been suggested, most notably curriculum changes to give more emphasis to active learning and onsite experience, and to increase the role of mentors. While most students currently have adequate work experience, this is not universal and the quality of work experience is often criticised.

The Taskforce considers it would be valuable for universities to work with industry to provide mentoring and structured work integrated learning opportunities for students throughout their degrees. However, as students are at greatest risk of leaving in their first two years of study, it would be valuable to focus efforts on these years. Positive exposure at this stage may also help students to form their views about their specialisation, and enhance the quality of learning outcomes, as noted by Skills Australia in its *Australian Workforce Futures* report.

There are many models that could be used to promote work integrated learning. The ATN submission draws attention to a successful Canadian model:

A proven model that could work successfully in Australia might be an approach based on Canada's highly successful cooperative education programs, involving around 73,000 students. Students combine academic study with related job experience through alternating academic and work terms. They combine conceptual learning with application in an authentic work environment, while earning wages to offset the cost of their education to themselves and the state. The students are paid wages during their co-op work terms and pay taxes on those wages. The government provides a co-op tax credit for employers of students on co-op placement.

ATN submission

Equally, some universities in Australia already have good models for supporting work integrated learning for engineering or other disciplines, and these should be explored.

Australian National Engineering Taskforce

Earlier this year the Australian Government announced support for the creation of the Australian National Engineering Taskforce (ANET), a partnership between the Association of Professional Engineers, Scientists and Managers Australia, Engineers Australia, Consult Australia, the Australian Council of Engineering Deans (ACED) and the Australian Academy of Technological Sciences and Engineering.

ANET is investigating engineering skills shortages to create a national strategy with a particular focus on the demand and supply of engineering skills in key industries; workforce development, and pathways for engineering education. A report on the findings will be finalised by the end of 2010.

RECOMMENDATION 3.2

That the Australian Council of Engineering Deans work with the Minerals Council of Australia, the Australian Petroleum Production & Exploration Association, and the Australian Constructors Association (taking into account work being done by the Australian National Engineering Taskforce) to encourage their members to provide structured, work-integrated learning opportunities, such as internships and mentors, for all first and second-year engineering students.

13. Meet temporary skills shortages with temporary migration

This chapter examines the role of skilled migration programs in helping to meet the skills needs of the resources sector. Temporary migration will be important over the next few years as a source of supply for mining engineers and geoscientists.

The labour market for professionals in the resources sector is considered a global one with many resources companies operating in Australia regularly transferring employees between projects and countries. Between 1 July 2005 and 30 April 2010, resources sector employers were granted around 1,640 Subclass 457 visas for mining/petroleum engineers, and around 2,300 for geoscientists.

Over the past two decades migration has increased to address skills shortages. Over two thirds of the current permanent migration program is for skilled migrants. However, migration is just one tool for meeting Australia's future skills needs, and complements the ongoing training and upskilling of the Australian workforce, as the Association of Professional Engineers, Scientists and Managers (APESMA) notes in its submission:

Immigration is a key aspect of any strategy to alleviate labour supply issues. However, Australia's current level of reliance on skilled migration, and on international students to fill local engineering university courses, is not a sustainable strategy to meet gaping capacity shortages across industries into the future. Australia is currently supplying only just over half of its engineering needs through the education system, a particularly tenuous position considering that employers compete in a global market for engineers.

APESMA submission

Submissions recognised training alone cannot meet the ongoing needs of the resources sector and skilled migrants have an important role in skills development for Australians:

These skilled workers pass on their techniques and experience through knowledge transfer to Australian industry, thus sharing critical experience and good practices from overseas and adding value to the economy.

APPEA submission

The nation's population alone cannot meet the anticipated skills demand of the resources sector in a timely manner. Therefore, the skilled migration system should complement the continuing development of the skills of the nation by providing highly skilled migrant workers where those skills are not currently available in sufficient quantities in the Australian workforce.

MCA, CMEWA and QRC submission

13.1 Australia's migration arrangements

The Australian Government maintains a permanent migration program and a temporary program of visas, some of which include the entitlement to work, such as the employer-sponsored Subclass 457 visa and labour agreements.

Permanent migration

The Permanent Migration Program will provide for a total of 168,700 places in 2010–2011:

- 54,550 places for family migrants who are sponsored by family members already in Australia
- 113,850 places under the General Skills Migration (GSM) program, the Employer Nomination Scheme (ENS) and Regional Sponsored Migration Scheme (RSMS), among others, for skilled migrants who gain entry because of their work or business skills
- 300 places for special eligibility migrants and people who applied under the Resolution of Status category and have lived in Australia for 10 years.

General skilled migration

There are a range of visa options under the GSM program for skilled workers who want to live in Australia and do not have an employer sponsoring them.

The program is designed to attract young, highly skilled people, with a good level of English language ability and skills in particular occupations that are required in Australia. These occupations are listed on Australia's Skilled Occupation List (SOL) which is available on the Department of Immigration and Citizenship's (DIAC) website (www.immi.gov.au).

The SOL is a key element in the GSM program as a person cannot apply for a GSM visa unless their occupation is on the SOL. The new, more targeted SOL introduced from 1 July 2010 focuses on high value professions. The new SOL will deliver migrants who have better chances of success in the Australian labour market.

The mining sector generally sees the GSM program as incidental to their immediate needs, but recognises the longer-term benefits of correct migration planning:

MCA, CME and QRC jointly strongly agree with the principle that the General Skilled Migration program targets should be set against medium-long term skill needs rather than the more cyclical nature of labour demand that characterises many Australian industries

MCA, CMEWA and QRC submission

The reality of Australia's GSM program is the benefit it provides to employers is indirect—it broadens the domestic skills pool beyond what the existing population could otherwise provide.

Employer sponsored migration

Through employer sponsored migration, such as the ENS and RSMS, skilled migrants are sponsored directly into positions where a skills shortage exists. This links skilled migrants directly to employment and leads to better settlement and economic outcomes.

Skilled workers can be recruited either from overseas, or from people temporarily in Australia. Nominated positions must relate to an eligible occupation listed on the Employer Nomination Scheme Occupations List (ENSOL). The majority of skilled occupations, down to trade level, are included on ENSOL. Employer sponsors need to meet a range of nomination requirements, which include a commitment to the employment and training of Australians lawfully operating a business in Australia and complying with all Australian workplace laws. The nominated position must provide full-time employment in Australia for at least three years.

Migration policies are set to favour applicants that are sponsored by an employer to work full time in a skilled job. The value of the employer sponsored scheme is that it provides certainty to the visa applicant, who has a job from the time they arrive in Australia, and allows the employer to fill an employment need that could not be filled locally. There has been significant growth in this demand-driven visa scheme over the past decade.

State and territory migration

The Taskforce welcomes the introduction of State Migration Plans, which now help states and territories address projected skills shortages through permanent migration.

Under State Migration Plans, state and territory governments will be able to sponsor applicants to help address intractable skills shortages. Plans are currently being negotiated across Australia that will specify the number of applicants each state and territory government can sponsor and the occupations of those applicants. In other words, each state and territory can address their unique skills shortages.

States and territories will be able to access a broader range of occupations than those included on the SOL, recognising skills demand and supply can vary greatly across Australia. Industry sectors in each state and territory have the opportunity to work with the relevant government to ensure their key shortage occupations are identified on the plan. This will provide a new avenue to meet industry's skills needs through permanent migration.

Temporary migration

In addition to the Permanent Migration Program, the Australian Government maintains a range of temporary visas including the employer-sponsored Subclass 457 visa, labour agreements, and other temporary visas which include the entitlement to work in Australia. The most relevant temporary visa options for the resources sector are the Subclass 457 visa program and through negotiated labour agreements.

Subclass 457 visa

The Subclass 457 visa program is an uncapped temporary visa program driven by employer demand for skilled workers. It allows employers to sponsor overseas workers to fill skilled vacancies in identified occupations for up to four years. The overseas workers then either return home or qualify for another visa, including permanent residency.

Visa applicants are required to have skills and qualifications which are appropriate to those required for the occupation in the Australian labour market. In certain circumstances they are required to meet English language requirements and, in the case of trade applicants, to have their skills formally assessed by Trades Recognition Australia.

Submissions to the Taskforce indicate a divergence of views around the use of the Subclass 457 visa program, best summarised by the following comments:

The mining industry is a global industry, with many multinational companies having workforces in several countries; hence, mining industry skills are internationally transferable...Skilled migrants on temporary (457) skilled migration programs, particularly in critical professional roles are a key component of the minerals sector's response to overcoming skills capacity constraints and maintaining the minerals sector's productivity.

MCA, CMEWA and QRC submission

Chevron Australia's ability to access international skilled labour under the 457 temporary visa program enables the development of our projects and growth of our business. As a result, Chevron is able to offer increased employment opportunities for Australian workers.

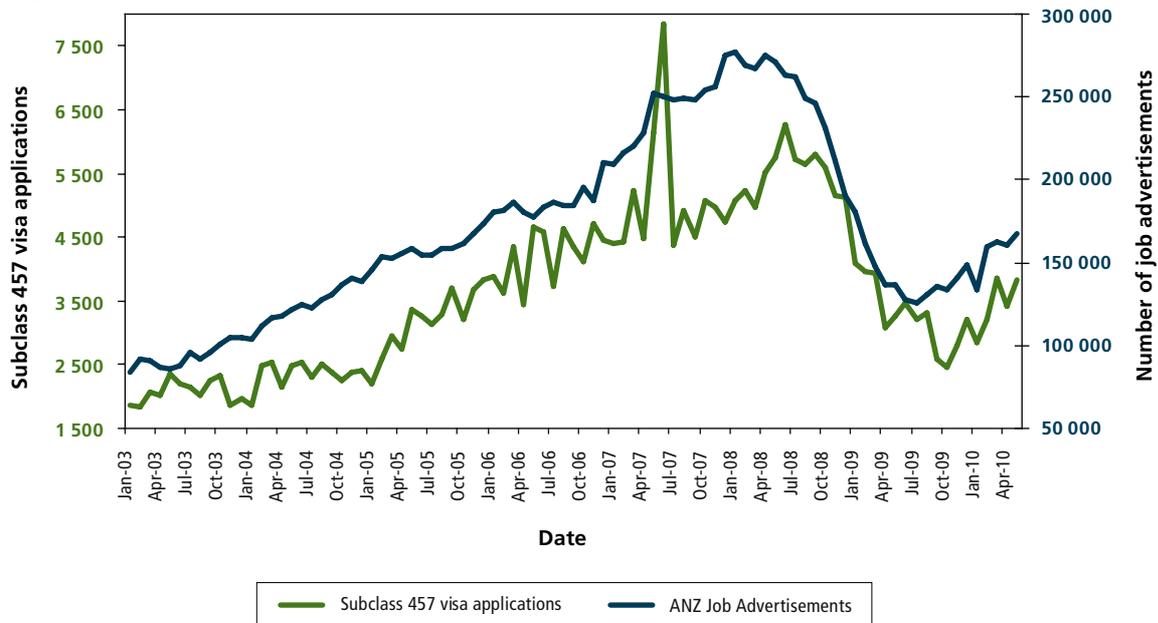
Chevron submission

The CFMEU supports permanent migration but does not support employer sponsored temporary skilled migration on the 457 visa, other than in exceptional circumstances...

Construction, Forestry, Mining and Energy Union of Australia submission

Some submissions from unions suggested Subclass 457 visa applications should be subject to labour market testing, citing concerns the use of temporary migration reduces investment in the skills development of Australian workers. There is no evidence the Subclass 457 visa program reduces skills development of Australian workers. The program is strongly demand driven and provides a circuit breaker for emerging skills shortages. For example, as Figure 14 shows, as job vacancies rise, so do applications under the program. Figure 15 shows as unemployment rises, the use of the program falls.

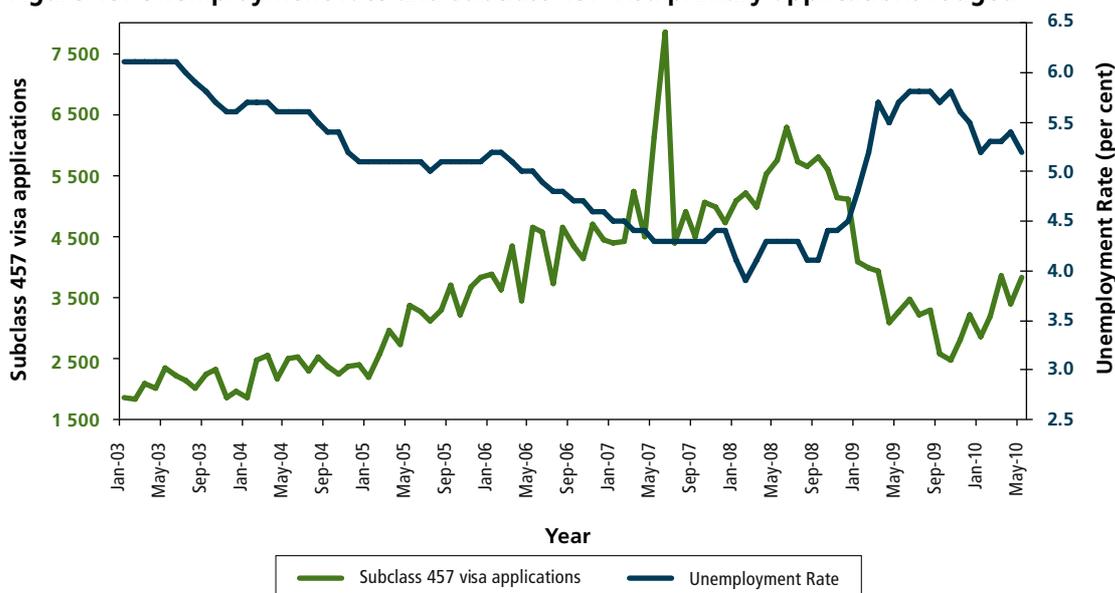
Figure 14: ANZ job advertisement series and subclass 457 visa primary applications lodged



Source: DIAC 2010, unpublished

Note: The spike in June 2007 was a result of the announcement in the last week of June of the introduction of the English language requirement for trade occupations from 1 July 2007. Modelling by the DIAC suggests that over 1,800 additional applications were lodged in the last week of June as a result of the announcement, which then resulted in a lower application rate over the following two to three months.

Figure 15: Unemployment rate and subclass 457 visa primary applications lodged



Source: DIAC 2010, unpublished

Note: The spike in June 2007 was a result of the announcement in the last week of June of the introduction of the English language requirement for trade occupations from 1 July 2007. Modelling by DIAC suggests that over 1,800 additional applications were lodged in the last week of June as a result of the announcement, which then resulted in a lower application rate over the following two to three months.

In September 2009, the Australian Government reformed the Subclass 457 program to increase the focus on training Australian workers, and to ensure temporary migrant workers are provided equivalent terms and conditions of employment.

While the Subclass 457 visa program is a temporary migration program, it has proven to be an important pathway to permanent migration (see Table 18). Data sourced from DIAC shows that over 50 per cent of people granted a subclass 457 visa are successful in achieving permanent residency (PR) status, the overwhelming majority under employer sponsored arrangements.

Table 18: Number of Subclass 457 visa holders subsequently granted a permanent visa

Financial year of Subclass 457 visa approval	2003–04	2004–05	2005–06
Number of Subclass 457 visas granted	37,811	46,896	68,655
Basis for permanent residency	Of the above Subclass 457 visas granted, the number of persons subsequently granted permanent residency is shown below		
Employer sponsored	12,523	16,760	24,335
General skilled migration	4,816	5,555	7,069
Other permanent (e.g. family, resident return)	2,591	1,987	2,175
Total persons subsequently granted a permanent / provisional visa	19,930	24,302	33,579
Percentage granted a permanent/provisional visa	52.71%	51.82%	48.91%

Source: DIAC 2010, unpublished

Note: While the percentage of people granted a permanent resident visa is higher for the group granted their 457 visa in 2003/04, they have had two years longer than the group granted their 457 visa in 2005/06. The fact that the rate of transfer to permanent residency is almost as high suggests employers are increasingly using the two schemes to complement each other and transfer skilled workers permanently into Australia.

The rate at which employers are sponsoring Subclass 457 workers to permanent residency suggests the program is working quite effectively in filling short-term skills gaps and then translating these into permanent arrangements. The data also show visa holders are progressing through to permanent visas at a faster rate, with those granted subclass 457 visas in 2005–2006 almost overtaking the rate for those granted two years earlier.

Visa costs and processing times

Companies have raised concerns about the cost and processing time associated with the subclass 457 visa program.

In 2010–2011, the government cost to nominate and apply for a 457 visa for a worker is \$335.

The Taskforce points out the time taken to process 457 applications is proportional to the completeness of the applications and suggests employers examine their processes. Table 19 shows around 90 per cent of applications are incomplete and require additional information which delays processing times.

Table 19: Processing times of Subclass 457 primary applications lodged in 2009–2010 (to 30 April 2010)

Processing times of Subclass 457 primary applications lodged in 2009–2010 to 30 April 2010	For agent lodged	For sponsor or applicant lodged	For total applications lodged
Approved within two business days of lodgement with DIAC	12.8%	5.5%	9.3%
Approved within one week of lodgement with DIAC	28.2%	12.9%	20.8%
Approved within two weeks of lodgement with DIAC	45.2%	25.0%	35.4%
Approved within three weeks of lodgement with DIAC	55.3%	35.3%	45.6%
Approved within four weeks of lodgement with DIAC	62.3%	44.1%	53.5%

Source: DIAC 2010, unpublished

The Taskforce believes improved written information from DIAC about the legal and policy requirements of the program and regular information sessions for human resources specialists could improve the efficiency of the resources sector’s application processes.

RECOMMENDATION 4.1
 That the Department of Immigration and Citizenship improves the information and support available for employers wishing to use the Subclass 457 visa program and agrees to finalise applications within five working days of a complete application being lodged with the department.

Labour agreements

A labour agreement is a legal contract between the Australian Government and an employer which allows the employer to bring in skilled overseas workers to Australia on either a temporary or permanent visa.

Negotiations for a labour agreement focus on:

- company and industry structure and background
- occupations, skill levels and qualifications of the proposed overseas nominees

- information on the employment terms and conditions that apply to the occupation(s)
- evidence of shortages or expected shortages in the required skills
- education and training undertaken by the company, including expenditure on training and details of any initiatives taken to train Australians and reduce dependence on overseas recruitment.

In some situations a labour agreement is the only option available to an employer who wants to access employer-sponsored migration programs. Examples include when the skills an employer needs are not on the relevant list of approved occupations but a genuine shortage exists, and when they are recruiting labour for an unrelated business (for example, labour hire companies).

Other employers use labour agreements for strategic workforce planning purposes. Examples include a need for large numbers of workers for short-term projects, or when employers are certain skills shortages in particular occupations will impact on their projects, or the skills needed for the project are not available under standard visa programs. These reasons for using labour agreements are likely to resonate with many companies in the resources and construction sectors.

Labour Agreements provide the opportunity for employers to work with the Australian Government to identify the best migration options for meeting their particular skills needs. They appear to be largely under-utilised by the resources sector, with fewer than 10 active agreements in place, only one of which relates to a significant resources project.

A significant factor contributing to the under-utilisation of Labour Agreements is that employers perceive they take too long to negotiate. The minimum amount of negotiation time needed is around three months, which is not inconsistent with other significant contracts in resources projects. Advice from DIAC suggests the average processing time is between six and nine months and some take over 12 months.

When seeking access to a Labour Agreement, companies need to be able to demonstrate the entry of overseas workers under their sponsorship will be of positive benefit to Australia and companies should work to gain the support of their state or territory government and relevant unions.

The Taskforce sees considerable potential benefits in the use of Labour Agreements, particularly for the construction phase of projects where there may be competing construction projects occurring concurrently. They are an important adjunct to workforce planning where employers have identified occupations may be in short supply, may not be available under standard program arrangements, or may have tighter processing requirements, such as the need for a skills assessment.

Labour Agreements could provide resources and construction sector employers with a flexible response to their needs, while at the same time ensuring overseas recruitment does not prevent the longer term improvement of employment and training opportunities for Australians.

The Taskforce recommends that a special form of Labour Agreement—Enterprise Migration Agreements (EMA)—be introduced for mega resources projects. These would provide streamlined access to migration for mega projects, pre-qualifying employers and reducing negotiation timeframes. EMAs will allow for multiple employers engaged on the project to have access to the agreement.

The Taskforce further recommends the Australian Government consider including the following qualification criteria for employers wishing to enter into an EMA:

- a credible workforce plan that justifies the need for overseas workers
- evidence of market testing for trades occupations
- exemption from skills assessments where the nominee is an intra-company transfer and has been employed by the sponsor for a period of time (recommended two years)
- justification for access to overseas workers to fill lower skilled roles (where required) including evidence of recent domestic recruitment action and a clear explanation as to why Australian citizens could not be trained for the positions
- a credible plan for training Australians to fill lower-skilled roles (where the need is ongoing)
- identification of contractors that have responsibility for parts of the project that do not currently operate or have a base in Australia. As some of these will not be known during EMA negotiations, the enterprise would need to notify DIAC as soon as a contract is let to such a contractor
- skills clearances provided by a reputable RTO, where there is a demonstrated recent history between the RTO and the enterprise
- appropriate programs to provide induction, site and safety training to Australian standards, and to settle overseas workers into Australian life
- social inclusion programs for Indigenous communities, such as those that promote improvements in community health, education and social development
- training programs for Indigenous people with a focus on employment outcomes
- pastoral care arrangements to support families
- training programs to upskill the existing workforce
- evidence of consultation with relevant industry stakeholders.

To assist employers interested in an EMA, DIAC, in conjunction with other relevant agencies including DEEWR, would develop a template for employers to complete as part of their request for access. Such a template would set the parameters, explain what is needed to meet the requirements for an EMA and be publicly available.

Employers need certainty around negotiation timeframes. For the EMA process to be effective, the Taskforce recommends the government agree to publicly list the requirements that would need to be satisfied for a resources project to have access to these agreements. The Taskforce also believes negotiation of these agreements would need to be completed within a three month timeframe, commencing from the time the employer submits a formal request to access an EMA.

RECOMMENDATION 4.2

That the Australian Government introduce and promote the appropriate use of Enterprise Migration Agreements for 'mega' resources projects. As part of these agreements, the Australian Government should provide for pre-qualification of skilled occupations to create greater efficiency and certainty to project proponents during the critical construction phase.

14. Strengthen workforce participation

This chapter explores opportunities to strengthen workforce participation through targeted measures to connect unemployed job seekers to jobs in the resources and construction sectors, and increase the participation of women and Indigenous Australians.

14.1 Connecting unemployed job seekers with jobs in the resources and construction sectors

One of the fundamental challenges for the resources sector is projects in remote locations. This makes the task of connecting the resources sector and unemployed job seekers more difficult, with a role for market and non-market mechanisms to help achieve this connection.

14.1.1 Using local job seekers to fill the skills gaps

Many employers reported few difficulties attracting applications for vacant positions for entry-level and semi-skilled positions in remote locations but few of the applicants were suitable:

It is not uncommon for Newcrest to receive 100's if not 1,000+ applications for entry level, unskilled operator roles, when advertised, especially in a residential location such as Orange. Attracting potential industry newcomers does not seem to be a significant problem. Perhaps the greatest challenge and/or opportunity is identifying the best candidates from such a pool and reducing the new starter training liability.

Newcrest submission

Apart from a lack of relevant skills and experience, other concerns reported were poor language, literacy and numeracy skills of applicants; lack of competency in communications, teamwork and reliability; and an inability to meet the stringent occupational health and safety requirements in the resources sector. As noted in *Australian Workforce Futures, A National Workforce Development Strategy*, 60 per cent of unemployed Australians have 'a level of literacy below the accepted standard needed to work in the emerging knowledge-based economy' (Skills Australia, 2010: p. 3).

RECOMMENDATION 5.1

That the Australian and state and territory governments develop a national strategy to enhance language, literacy and numeracy skills of job seekers to maximise workforce participation.

Knowing there will be increased demand for certain types of skills, employers and other stakeholders should work together to ensure job seekers are competitive for jobs.

RECOMMENDATION 5.2

That the Minerals Council of Australia, with support from the Australian Government, Western Australian and Queensland Governments, relevant industry skills councils and state skills bodies, Job Services Australia providers and unions, work with employers in the Pilbara and Bowen Basin on programs that lead to sustainable job outcomes in the mining sector for local people not currently in the workforce.

14.1.2 Relationships between employers and employment services providers

A very low proportion of job placements in the mining industry are filled with the assistance of Australian Government contracted employment services providers and mining placements account for a smaller share of Job Services Australia placements than mining's share of total employment. This suggests there is significant scope to improve labour matching by forming better relationships between service providers and employers. Employers find it frustrating and time consuming to have to deal with numerous, fragmented employment and training organisations to achieve a particular workforce outcome:

Typically, Australian employment services are used by employers in a transactional manner to fill vacancies as they emerge with inadequate time to initiate strategic responses to skills development. This coupled with a lack of clear data about projected needs places significant limits on the capacity of employment services to fulfil a more robust labour market intermediary role to develop and connect appropriately skilled job seekers to vacancies.

NESA submission

The most effective employment programs of recent years have been those that have started by identifying employers or industries with actual job vacancies in a specific skill area. With a strong commitment from the employer, employment services providers can then move towards identifying potential candidates and working collaboratively with the employer and local training organisations to develop a training program that responds to industry requirements and offers the job seeker both employment and accredited training.

Jobs Australia submission

Although there is a benefit in more effective project-by-project connections, a strong theme in the submissions was for regional coordination of employers, training organisations and employment services providers to better meet the needs of employers and increase employment opportunities for local people.

Employers find it difficult to navigate the different forms of assistance available to increase training and employment in the sector. Employers, particularly small to medium-sized businesses have difficulty sourcing information on available programs and initiatives, determining their suitability and receiving assistance relevant to their needs.

While some are sceptical of the need for additional coordinators, others suggest this could help meet employers' labour needs and maximise employment outcomes for local people. A coordinator could work with employment services providers to help fill 'gaps' in industries that lose workers to the resources sector.

RECOMMENDATION 5.3

That the Australian and state and territory governments consider funding a pilot program for employment brokers to help meet the workforce needs of resources projects based near regional population centres and maximise opportunities for unemployed people. The brokers would work with resources companies, their contractors and service industries to develop recruitment plans and then coordinate the efforts of employment services providers, training organisations, Indigenous organisations and other service providers to meet project needs.

14.2 Boosting employment participation in regional hubs

The Taskforce's terms of reference require that it develop a workforce development plan that considers the mobility of skills and the importance of FIFO/DIDO skilled workers and maximises employment and training opportunities for local communities.

Activity in the resources sector has a significant effect on the pattern of regional development. There are many ways in which resources projects find the necessary labour, supplies and other services required to support their operations including FIFO/DIDO and the use of nearby regional hubs which have developed over time. For instance, mining equipment may be fabricated onsite, in regional hubs or in more distant locations.

Many submissions to the Taskforce agreed there was potential for further regional development near major project sites to support local employment.

Community leaders, unions and employer groups agreed that maximising local procurement and local economic development would offer opportunities for local skills development.

FIFO arrangements can be used to provide employment opportunities for people in other regions. Such opportunities are likely to be greatest during the construction phase of projects.

FIFO in Regional Areas—Cowra

In a submission discussing the impacts of FIFO operations, Councillor Bruce Miller, President, Shires Association of New South Wales and a Councillor on the Cowra Shire Council describes the benefits that have flowed to the Cowra community as a point of origin for FIFO workers. He acknowledges that FIFO can place stress on families through absence but contrasts this with the stress of relocation and the issues surrounding accessing community networks in remote localities.

'Moreover, these FIFO workers' pay is directed back through their families to help maintain our local economy. It helps in a small but tangible way to arrest the drift of population to larger employment centres—if the FIFO worker were to go to another employment centre within the state, there is a greater likelihood their families would go as well. While there is clearly no one model that works for every resource development, the continuing use of FIFO workers must help alleviate the need to spend significant amounts of money on smaller, limited life towns as was the prevailing model until the 1980s.'

Cairns was commonly suggested as an urban centre having significant growth potential as a mining services and FIFO hub because of its existing service base and sizeable pool of job seekers. CITIC Pacific Mining participated in a Centrelink Jobs Expo in Cairns on 25 June and advised the Taskforce their recruiters met a number of potential candidates (including quality tradespeople) for positions at their Sino Iron Project, south of Karratha.

RECOMMENDATION 5.4

That the Australian Government fund an industry-based, FIFO development coordinator in Cairns for two years from July 2010 as a pilot, to develop links between resources projects in remote locations and skilled workers, including local unemployed job seekers. If successful, this measure could be replicated in other appropriate locations, jointly funded by the sector and governments.

14.3 Working together to increase women's participation

Women are a relatively untapped source of labour for the resources and construction sectors, currently representing only 13 and 12 per cent of their respective workforces (ABS, 2010).

There are many barriers to women's participation. Submissions to the Taskforce highlighted current problems associated with working in remote locations, the lack of family-friendly work practices, the scarcity of part-time jobs and a male-dominated workplace culture.

Employer submissions recognise the strong benefits to businesses of employing more women. Female employees not only address labour shortages, they create more balanced workplace cultures that promote job satisfaction, productivity and employee retention. Research also suggests major financial benefits to resources companies of having more women in senior management roles (Catalyst, 2004, 2007; McKinsey & Company, 2007). In their submissions, companies illustrate their efforts to employ more women:

- Chevron, Rio Tinto, ConocoPhillips, Woodside and other companies have already implemented programs to improve workplace flexibility with paid parental leave, part-time employment, job sharing, working from home, compressed work hours, and purchased leave.
- Some companies now provide access to childcare.
- Many companies also set targets for women's participation. For example, Rio Tinto sets a target for its annual graduate intake of 30 per cent women, which has been met or exceeded for the past five years.

Companies have credited such programs with making considerable improvements in their ability to attract and retain female staff. For instance:

- Woodside credits its supportive workplace policies with an increase in the numbers of women returning to work after parental leave and in the number of women in senior level positions.
- ConocoPhillips believes its diversity and inclusion policies have encouraged more women to consider engineering, geosciences and geo-data roles.
- BP Australia considers its success in employing women is due to its innovative suite of policies and recruitment practices—46 per cent of its overall 2,321 person workforce is female, and 20 per cent of workers at its Bulwer Island Refinery are female.

There are no limits imposed by gender within this industry—many young women already realise this. Women don't want special treatment...they just want flexibility. If employers understand this they will find an abundant skilled labour resource to be tapped.

Alice M Clark, Director, CdeK Geological and Mining Services, 2010

Driving change in the Pilbara—women in mining at CITIC Pacific Mining

CITIC Pacific Mining has an ambitious strategy to significantly improve the proportion of women within the Sino Iron Project, south of Karratha. The strategy is starting to reap benefits. The company now employs around 180 women across its workforce of just over 580 people, including around 15 female haul truck drivers.

As Deputy Director—Operations Mr Andrew Thomson explains: ‘We often find women are more consistent in general with the operation of equipment such as our haul trucks. Women tend to be more careful and “softer” on machinery than some younger males. That said, we have excellent male and female operators and a combination of both in our crews is beneficial. Sometimes couples are able to be hired meaning there is the added benefit of having two good, long-term operators working in the same team.’

Other companies have made a commitment beyond their own organisations to support and encourage women to consider non-traditional roles. For example, ExxonMobil has partnered with the University of Melbourne’s School of Engineering to promote engineering careers and study opportunities for women. As APPEA points out in its submission, women represent only 15 per cent of engineering enrolments at universities across Australia, and only 6 per cent of currently practising professional engineers are women.

In 2007, the Australian Government and the MCA launched *Unearthing New Resources*, a series of research reports that marked the start of a ‘five year strategic agenda to increase the participation of women in the minerals industry’ (MCA, 2007). The Chair of the MCA Board at the time, Peter Coates, said:

We consider that these research reports, outlining the issues affecting the attraction and retention of women, provide a rigorous and transparent platform for the minerals industry to improve its performance in providing a more gender inclusive environment.

Peter Coates, Former MCA Chair

In its joint submission to the Taskforce, the Australian Industry Group (AIG) and the Australian Constructors Association (ACA) referred to the *Unearthing New Resources* work, saying:

What is not clear is how much progress has been made on the implementation of these strategies. It is our view that this report and its recommendations provides a blueprint for collaboration between the private and public sectors including the education sector and its implementation should be encouraged and promoted.

AIG/ACA submission

The recommendations in *Unearthing New Resources* identified the need for targeted measures to increase the recruitment and retention of women. It is clear from the examples above that many large resources companies individually are addressing this issue. However, it may be that smaller companies are not.

The recommendations in *Unearthing New Resources* also encompassed the need for stronger leadership regarding women’s participation in the sector. The Taskforce noted the strong leadership of APPEA by Belinda Robinson, and Nicole Hollows as the President of the Queensland Resources Council (QRC), which has another female member in Helen Gluer.

QRC has been actively promoting the resources sector as a viable career option for women for several years. In 2005, QRC commissioned a study to identify the barriers to women's participation in the sector, finding, like the *Unearthing New Resources* reports and others before them, that the main issues related to work and family life balance, the lifestyle associated with living in remote areas, and the lack of professional development opportunities (Colmar Brunton, 2006). QRC used the findings of the report as the basis for its *Women in Resources Action Plan*, which aims to increase the proportion of women in the resources sector in Queensland, particularly in non-traditional roles.

The employment of women in the Queensland resources sector has more than doubled since the *Women in Resources Action Plan* was implemented, requiring member companies to agree to actions. Last year QRC reported that from 2005–2006 to 2008–2009, the number of:

- women in executive and senior management roles increased by 400 per cent (from 22 to 110)
- female engineers rose by 62 per cent
- female geologists rose by 59 per cent
- female tradespeople rose by 275 per cent
- female operator/production employees rose by 207 per cent.

However, as QRC CEO Michael Roche noted at the time, 'women still make up only 1 per cent of tradespeople, 8 per cent of operators/production employees, 12 per cent of engineers and 11 per cent of executive management, so we still have a long way to go'(QRC, 2008). It is notable that women are not represented on the boards of MCA, APPEA or ACA.

Women in mining making a difference—Donna Frater

Donna has been Chair of the National Women in Mining Network for the Australasian Institute of Mining and Metallurgy (WIMNet) since 2008 and is a committee member of the Minerals Council of Australia's Workforce Standing committee. She has over 18 years experience in exploration and mining as a geologist.

In 2002 Donna started with BHP Billiton Mitsubishi Alliance as a project geologist in their Central Queensland office on existing operations and greenfields exploration projects. In 2005 she moved to Brisbane to join BMA's Project Development Group as Principal Geologist.

Donna believes the mining sector has a lot to offer women including challenges and experience like no other workplace, the opportunity for professional achievement and financial security.

Donna supports mentoring and regional networking as effective ways of supporting and connecting women in the mining industry and believes cultural change is needed to boost women's participation.



Taskforce Chair Gary Gray with Donna Frater (l) and Kirsten Livermore MP, member for Capricornia (r). Photo courtesy Daily Mercury, Mackay. Photographer Tony Martin

The sector needs a new strategy to increase female workforce participation. The Taskforce recommends the development of an industry wide strategy. To be effective, the strategy should be led by senior industry leaders and informed by the work of the Equal Opportunities for Women in the Workplace Agency. It should take into account lessons from existing strategies and initiatives, and could be based on initiatives like Engineers Australia 'Women in Engineering' Strategic Plan 2008–2012, which encourages women into the engineering profession through a mix of social activities, scholarships, awareness programs and personal development.

However, the Taskforce recognises change must occur at the company level. Companies are urged to review their recruitment practices and workplace policies and be prepared to try new things. They should work to ensure they have genuinely flexible arrangements and address cultural issues. This will require leadership and a strategic commitment.

RECOMMENDATION 5.5

That the Department of Education, Employment and Workplace Relations (DEEWR) or the Equal Opportunity for Women in the Workplace Agency work with the Minerals Council of Australia, Australian Petroleum Production & Exploration Association, Australian Constructors Association, unions and education and training providers in appointing a consultant to develop a strategy for attracting and retaining women in the resources and construction sectors.

14.4 Increasing Indigenous participation

According to the 2006 census, of the 122,749 Indigenous people in employment the mining sector employed 2,488 and the construction sector employed 8,386. When expressed as a percentage of their respective workforces, 2.3 per cent of the 106,893 people in the mining sector were Indigenous, while 1.1 per cent of the 709,843 in the construction sector were Indigenous (ABS, 2007).

There is strong support in all sectors for increased Indigenous participation:

The minerals industry recognises that the effective engagement of Indigenous people in our industry is not only the right thing to do, but there is a compelling business case. The majority of our operations are co-located with Indigenous communities—local workforces and communities with shared aspirations to create societal value from minerals development.

MCA, 2009

The oil and gas industry is committed to taking measures to promote and increase the opportunities for Indigenous employment both with our companies and contractors directly, and in pursuing economic capacity building for Indigenous communities. The industry recognises the benefits of pursuing the participation of Indigenous Australians in the workforce and that much needs to be done in this area.

APPEA submission

Submissions cited many of the well understood barriers to increasing the employment of Indigenous people, including lack of foundation skills, poor health, drug and alcohol problems. Many companies have longstanding commitments to address these issues through

Indigenous-focused health, education, employment and social programs, such as the Rio Tinto Aboriginal Fund. The Taskforce acknowledges, however, that the major responsibility for such tasks lies with Australian, state and local governments. Submissions urged governments to increase their efforts in this regard, including through the Council of Australian Government's agreement to work towards closing the gap in Indigenous disadvantage.

Many companies indicated they already have extensive policies in place to increase the direct employment of Indigenous people on resources projects and to support indirect employment by contracting Indigenous companies through their supply chains.

14.4.1 What companies are doing and lessons learned

Targets

A number of companies have adopted voluntary targets to increase Indigenous employment. For example, Woodside has a global target of trebling its Indigenous workforce by the end of 2012. Rio Tinto has established specific targets at each of its operations, taking account of local demographic factors and business conditions. Rio's Energy Resources of Australia has a target of 25 per cent, Argyle Diamonds 40 per cent, Weipa 35 per cent and Rio Tinto Iron Ore 20 per cent.

Targets provide the benefit of ongoing measurement and reporting. They are often specified in Indigenous Land Use Agreements and translated through companies' reconciliation action plans. The Taskforce recognises targets may not be appropriate for every circumstance.

Employment programs

Submissions to the Taskforce reported that effective employment efforts contained a number of crucial features:

- pre-employment programs to improve language, literacy and numeracy skills
- programs to develop practical understandings of workplace environments and employers' expectations
- a direct link to a job at the end of a training course
- mentoring during the training and early career process. A major study into mentoring is currently being undertaken by the MCA.

Cultural awareness training

Companies also understand the need for cultural awareness to inform management practices and policies, including in relation to recruitment, training and workplace relations. Companies such as Lihir Gold currently run programs that engage local, culturally-sensitive staff to work alongside technical experts.

Newcrest Mining—working with the Martu community

The Newcrest Mining Telfer Gold Mine is located on Martu Land, in the Great Sandy Desert in the Pilbara. There are two mines, Telfer Open Pit and Telfer Underground. Telfer is a FIFO operation with about 1,000 personnel onsite.

The Martu Consultative Committee was established in 2003 to monitor agreements between Newcrest and the Martu people and to identify ways to develop their relationship. The Committee and Newcrest worked on the development of cultural programs, community development, education and training, and jobs.

Some of the Australian Government and community programs and initiatives include:

- provision of Workplace English Language and Literacy training (funded by DEEWR), followed by placement into employment, with over 50 participants since 2009
- Structured Training and Employment Project activities, including community-based pre-employment training, partnerships with RTOs, and an onsite community drop in centre
- programs to improve community health, education and promote employment, including healthy stores and lifestyle programs, school activities and mine visits, remote transport assistance and business development opportunities.

Newcrest maintains a 'Martu first' policy, and also prioritises appointment of other Indigenous people. Key aspects of Newcrest's approach to Indigenous training include:

- use of Martu mentors both onsite and in the community
- pre-employment assistance with medicals, inductions, licences and transportation
- provision of certificate training courses onsite and in the community as well as work experience
- Indigenous liaison officers who assist with transport in circumstances such as funerals
- a buddy system has just begun onsite—non-Indigenous personnel wishing to participate will undergo Newcrest's 'Working with Indigenous People' course
- an Indigenous Skills Register to record Martu people who have an interest in working at the mine.

There are currently 55 Indigenous men and women working at Telfer.

Recognising family and cultural needs

Companies are also trialling innovative ways to help Indigenous employees to balance their family and community obligations with the demands of full-time work. Northern Project Contracting has developed a FIFO roster of two weeks on and one week off that allows Indigenous employees to maintain strong family relationships and retain important cultural roles in their communities. They also give extended leave for funerals and other family responsibilities.

An Indigenous business success story—Northern Project Contracting

Northern Project Contracting (NPC) is an example of an Indigenous business that has flourished with the support of resources companies. NPC is a multi-million dollar company that specialises in contracting and training services for the civil construction and mining industries throughout Queensland and Australia. It is 100 per cent Indigenous owned and prides itself on achieving an 80 per cent Indigenous workforce.

NPC has double the industry average for retention rates of Indigenous workers, which the company attributes to its strong focus on employing local Indigenous people and work practices that reflect a real understanding of Indigenous culture.



Alfred and Errol Neal – photo courtesy of Northern Project Contracting

Specialist advice

In its submission to the Taskforce, Jobs Australia, the peak body for more than 270 non-profit providers of employment services, notes good support for companies can be found in specialist Indigenous employment organisations, which can assist employers with tailored, culturally appropriate pre-employment support services, employment placement services and mentoring. In its submission to the Taskforce, the Darwin Regional Indigenous Advancement and Community Development Employment Project (CDEP) Inc outlined how it helped 123 unemployed Indigenous job seekers gain frontline roles in the construction sector during the construction phase of the LNG plant in Darwin.

Supply chain opportunities

Companies are also making efforts to provide opportunities for Indigenous people through the project supply chain—often as part of their Indigenous Land Use Agreement. For example:

- Woodside employs dedicated contracts specialists to review and assess opportunities for Indigenous business participation in contracts
- BHP Billiton's iron ore division's Indigenous contracting team provides a 'one stop shop', through which Indigenous contractors can complete a once-only pre-qualification questionnaire to gain access to tenders.

Chevron contracts—opening the door to opportunities for Indigenous people

- Ertech (the Gorgon Site Development and WAPET Landing contractor) is putting Indigenous students through its Construction Academy in Perth. Students undertake structured, nationally recognised training for two days per week while still attending school. Students prepare CVs and attend mock interviews. On successful completion, they are invited to apply for permanent roles with Ertech and other companies.
- Offshore Marine Services Alliance (contractor to provide tugs, barges and small landing craft for the Gorgon Project) has employed five Aboriginal deckhands. This employment was facilitated by the Two Waters Indigenous Maritime Project training group.
- Compass, the Catering and Camp services contractor for Gorgon have recently employed Indigenous Hospitality workers who will transition to the Gorgon camp.
- Chevron is also working with the Australian Quarantine and Inspection Service (AQIS) to explore opportunities for quarantine traineeships for Indigenous trainees.

The Australian Indigenous Minority Supplier Council (AIMSC)

AIMSC is a not for profit organisation funded by the Australian and NSW governments. Its members are Australian companies and government agencies that have committed to AIMSC's vision to help to create a vibrant and prosperous Indigenous Business sector.

AIMSC helps its members to identify and approach certified Indigenous businesses that have products and services that meet their needs. It also helps its certified Indigenous businesses to successfully contract with buyers.

AIMSC works with members to help them embed diversity in their supply chain, and with suppliers to help them tailor their approach to market and business practices to win new and repeat work.

14.4.2 More needs to be done

Despite recent gains, much still needs to be done to increase Indigenous employment in the sector. The best approach will involve a combination of good planning and strong partnerships between employers and Indigenous communities.

Recently, several regions have taken a longer term Indigenous workforce planning approach, forming partnerships between communities, schools, training providers, employment services providers and employers. The Kimberley Action Plan provides a comprehensive and excellent example.

Kimberley Action Plan—a life cycle productivity approach to closing the gap (West Kimberley Gas Hub)

The Kimberley Action Plan focuses on closing the gap in the Kimberley region using a partnership model and a whole of life cycle approach. The plan includes over 100 activities in five priority areas: early childhood, schooling, training and employment in schools, work readiness training and employment, and economic development and participation.

Many of the activities in the Kimberley Action Plan and projects being undertaken under the Tripartite Forum are already well advanced and some examples include:

- National Partnership investments in the region in early childhood and schooling and remote service delivery
- Kimberley Success Zone, which provides resources to support learning, collaboration and the exchange of best practice and sustainable practices across the school sectors and clusters of schools
- Soundfield systems installed in all classrooms in the Kimberley
- Books in Homes for 4,500 school children across the Kimberley
- early childhood facilitator in the West Kimberley
- reading recovery program
- school attendance media campaign
- worker hostels in Halls Creek, Broome and other centres
- Work Readiness and Pre-employment program for the long-term unemployed
- development of Indigenous Workforce Development Strategies in the East and West Kimberley
- construction apprenticeships for Indigenous housing construction and refurbishment
- traineeships, apprenticeships and cadetships provided by industry partners
- feasibility study for an industry trade training centre
- developing options for the expansion of school trade training centres across the Kimberley — integrated with the industry trade training approach
- new Sporting Chance Academies in Derby and Women's Academies in Broome and Fitzroy Crossing
- introduction of the Indigenous Youth Mobility Program in the Kimberley.

This is also occurring within the context of considerable Australian Government effort. Major consultations are now underway on the May 2010 draft Indigenous Economic Development Strategy. The draft strategy focuses on five key areas for improving the prosperity of Indigenous Australians:

- education and building individual capacity
- creating sustainable job opportunities
- supporting business and enterprise development
- financial security and independence
- strengthening the foundations to provide an environment that supports Indigenous economic development.

The strategy sets priorities to improve Indigenous employment participation by building the skills of the Indigenous labour force, matching Indigenous Australians' job aspirations with employer's needs, and increasing private-sector employment and retention.

The strategy also identifies priorities for supporting Indigenous businesses, including:

- improving access to capital to support Indigenous business start-ups and business growth
- better aligning Indigenous business support programs
- increasing private-sector engagement and partnership
- supporting Indigenous role models and business leadership
- creating better sources of information about Indigenous businesses
- encouraging Indigenous business skills development.

The draft reflects many of the themes and principles embodied in the Memorandum of Understanding on Indigenous Employment and Enterprise Development, signed by the MCA and the Australian Government in May 2009, and the Working in Partnership program, managed by the Department of Resources, Energy and Tourism. The MoU and the partnership are currently in operation in eight sites: East Kimberley, Port Hedland, Ashburton/Roebourne, Newman, Boddington, Wiluna (all in WA); Tanami (NT); and Western Cape York (QLD).

The Taskforce believes additional effort should be made to give effect to the objectives of the MoU and ensure Indigenous people can benefit from the expansion of resources projects. The initial focus of activity should be the Pilbara and Rockhampton regions, noting both are expecting growth in employment in the resources sector and have a significant supply of unemployed Indigenous people.

The Taskforce recommends greater efforts be made in these regions to forge stronger links between employers, training providers and employment services providers. It is critical that such efforts be industry led. The Australian Government could support a broker in each region to develop region and industry-specific Indigenous workforce development plans that build on the objectives of the memorandum of understanding between the MCA and the Australian Government and seek to match Indigenous people to sustainable jobs in the resources sector. Indigenous people could be supported into employment through existing programs, including, where necessary, literacy and numeracy training, job readiness training, drug and alcohol rehabilitation and accommodation support.

RECOMMENDATION 5.6

That the Australian or relevant state government fund brokerage roles in the Pilbara and Rockhampton to forge stronger links between employers, training providers and employment services providers. The brokers should develop region and industry-specific, Indigenous workforce development plans that build on the objectives of the memorandum of understanding between the Minerals Council of Australia and the Australian Government, and seek to match Indigenous people to sustainable jobs in the resources sector in the region.

Recognising Indigenous businesses provide some of the best opportunities for the successful employment of Indigenous people, the Taskforce recommends additional support be provided to better integrate Indigenous businesses into the supply chain for major resources projects.

RECOMMENDATION 5.7

That the Australian Government, in conjunction with the Government of Western Australia, explore the possibility of expanding the capacity of brokers and mentors, and better use existing business support programs in the Pilbara (as a priority area) to work with existing small-to-medium sized Indigenous contracting businesses and resources companies to better integrate Indigenous businesses into the supply chain for major projects. If successful this model could later be replicated in other regions.

15. Forge stronger ties between industry and education

This chapter recommends measures to improve young people's awareness of the opportunities available in the resources sector by forging stronger ties between industry and education providers.

Awareness among young people will be improved by:

- creating clear pathways from school through university courses, apprenticeships and vocational training courses into careers in the resources sector
- establishing stronger connections between schools and industry particularly in regions where there are significant resources operations
- ensuring Trade Training Centres in resource-rich regions focus on preparing young people for the opportunities on their door step
- increasing school students' engagement with science and mathematics recognising these subjects open the door to careers in the resources and construction sectors.

15.1 Creating clear pathways

Resources sector employers prefer to take people on after they have completed an initial qualification and gained some relevant work experience.

Many submissions to the Taskforce indicate young people, older job seekers, careers advisers and employment services providers do not understand the skills and qualifications required by the resources sector, the opportunities available, and the best way to approach employers.

Selecting candidates would be simpler and less on-the-job training would be required for new starters if job seekers had a greater awareness of the skills and experience required.

Young people with a view to getting into the sector should undertake apprenticeships or enrol in degree programs. Pathways for some are fairly self-evident, such as mining engineering and geology, while pathways for apprenticeships and other kinds of vocational training are less obvious.

Employer and employee representative organisations recommended implementing strategies to improve awareness of jobs pathways and opportunities in the resources sector. Such strategies should not just be focused on young people but also unemployed people, mature workers, and people working in other industries who may be looking for a career change. Better information would also assist employment services providers and careers advisers.

RECOMMENDATION 6.1

That the Minerals Council of Australia and the Australian Petroleum Production & Exploration Association work with governments, unions, industry skills councils and education and training providers to develop a marketing kit to promote agreed career pathways and short and long-term job opportunities in the resources sector.

15.2 Building stronger links between schools and industry

Submissions to the Taskforce supported a partnership between companies and schools and vocational and higher education providers.

There are already some excellent localised examples of industry organisations and resources companies working with schools to support learning outcomes and encourage students to consider resources sector careers.

One example is Chevron's Working on Employment, Learning and Development (WELD) program at Onslow Primary School, which has students to year 12. Chevron is helping to improve student retention and attendance and develop secondary students' work-related skills.

Onslow WELD program

In the Onslow WELD program students visit Chevron's oil operations on Thevenard Island to learn about careers in energy, and the Mackerel Island Resort to gain insights into working in the hospitality industry. They learn life skills through participating in the Bush Rangers volunteer cadets program. Students learn applied skills like welding, culminating in building an aluminium boat. During the three year program they complete a Certificate I in Engineering through a partnership with TAFE, undertake workplace learning, attend careers camps and complete safety awareness and Senior First Aid training.

The Queensland Minerals and Energy Academy (QMEA) has a wider focus. QMEA is a partnership between the Queensland resources sector, represented by the QRC, the state Department of Education, Training and the Arts, and other educational stakeholders.

QMEA assists member schools and partner companies to deliver quality training in schools. Under the Australian Qualifications Framework (AQF), the qualifications are at AQF certificate level under the metal and engineering; chemical, hydrocarbons and refining; and resources and infrastructure training packages. This arrangement currently involves 28 Queensland state and private schools.

The QRC has sought to raise the profile of the resources sector in Queensland schools through its 'Oresome Resources' website (www.oresomeresources.com). The website provides free resources aligned with the Queensland curriculum and supporting science, maths, technology and social science teaching.

QRC also offers an online and face-to-face Teacher Professional Development Program for teachers and student teachers to become familiar with the latest resources and teaching strategies for engaging students in learning industry related topics.

Kwinana Industries Education Partnership (KIEP)

KIEP is an internationally recognised and awarded formal agreement and commitment between the Kwinana Industries Council and 13 high schools located in the Rockingham, Kwinana and Hamilton Hill regions of Western Australia.

KIEP aims to cultivate relationships between local high schools and industry partners with the broader goal of meeting the evolving needs of both local industry and education. KIEP's primary focus is to broaden the learning experiences of students through a wide range of community-related education and training activities.

RECOMMENDATION 6.2

That state and territory governments and employer associations work to further develop connections between schools, Trades Training Centres and the resources sector in major resources regions to support employment pathways for secondary school students.

15.3 Trade Training Centres

The Australian Government has made \$2.5 billion available over 10 years to enable all secondary schools to apply for funding of between \$500,000 and \$1.5 million to establish or upgrade Trade Training Centres. To date, 230 projects have been funded benefitting a total of 732 secondary schools. Part of a strategy to increase Year 12 completion or an equivalent qualification, Trade Training Centres are designed to encourage strong partnerships between schools, local industry and registered training organisations to improve the quality and sustainability of training available to students.

Participation in vocational education and training within the school environment has become increasingly significant. In 2008 there were 220,000 VET in Schools students, representing 41 per cent of students undertaking a senior secondary certificate (NCVER, 2010).

There is evidence of the success such training arrangements are having for students and employers. Feedback suggests students are likely to complete year 12 and pursue longer-term career options rather than drift into ad-hoc episodes of work and periods of unemployment.

Broome Senior High School

Around 110 secondary school students in Broome are undertaking training for an accredited qualification in construction and related competencies as part of their studies. The students, who are mainly Indigenous, are in Years 9 to 12. Many have already commenced work experience with local businesses. Working in collaboration with Kimberley TAFE, the program has been welcomed with enthusiasm by students and businesses. The program will graduate its first students at the end of 2010. Pat Kaye, head of Technology and Enterprise and Vocational Education said school attendance has improved significantly as a result of the program.



The former Minister for Education, the Hon Julia Gillard MP, with students from Broome Senior High School at the opening of the Trade Training Centre on 31 March 2010 – photo DEEWR

Submissions to the Taskforce indicated that delivering vocational training in schools strengthens literacy and numeracy skills which employers report are often insufficient among job seekers.

As the Trade Training Centre program has six to seven years to run there is scope to invest in more resources sector centres.

RECOMMENDATION 6.3

That the Australian Government work with education authorities to ensure future rounds of Trades Training Centre funding take into account the anticipated strong demand for skills in the resources and construction sectors. Schools with strong links to the resources and construction sectors could be targeted as they should have the greatest capacity to graduate Year 12 students into those sectors.

While VET study in schools, other than Trade Training Centres, has a high participation rate, there has generally been a low conversion to work and careers in industry.

Some Trade Training Centres have resources sector employer partners such as BHP Billiton, Mount Isa Mines and Iluka Mining helping to ensure the relevance of training and build connections to job vacancies. These relationships could be built upon and expanded.

RECOMMENDATION 6.4

That school and vocational education and training officials and stakeholders continue work to ensure that vocational training undertaken in a school context, or as part of a pre-vocational training course, is fully recognised for quality and relevance by employers and training organisations.

15.4 Advancing students' engagement with science and mathematics

Participation in science and higher levels of mathematics in the senior secondary years of schooling has been declining over many years. Science and mathematics are pre-requisites for many professional degrees and highly desirable for trades qualifications that lead to careers in the resources sector.

The pressing need from the resources sector's point of view is to reverse the declining participation in science and more advanced levels of mathematics and to address perceived problems with quality. This will increase the number of people with the necessary skills and qualifications to take up technical trades or to become engineers and geoscientists. It is important to address the things that are preventing students from pursuing science and mathematics in their senior years.

A 2008 study, *Maths? Why Not?* identified the following influences on student choice to study mathematics in their senior years:

- students' experience of junior secondary mathematics
- appeal of less demanding subjects
- advice by mathematics teachers
- student perceptions of their own mathematics ability

- parental expectations and aspirations
- understanding career pathways.

(McPhan et al, 2008: iv)

Similarly the *Choosing Science* study found subject choice in science is linked to experience of junior secondary science and affected by an abundant choice of other subject options, negative images of science-related careers and the costs and benefits of studying senior science (Lyons and Quinn, 2010).

The new Australian Curriculum may help to improve students' experience of junior and secondary science and mathematics, and address students' perceptions of their own ability.

The Australian Curriculum

All Australian governments are committed to developing and implementing Australia's first national curriculum.

Mathematics and science are among the first learning areas being developed for the Australian curriculum.

The draft mathematics curriculum aims to 'educate students to be active thinking citizens interpreting the world mathematically and using mathematics to help form their predictions and decisions about personal and financial priorities'. Recognising that mathematics has its own value and beauty the curriculum will help students to 'appreciate the elegance and power of mathematical thinking, experience mathematics as enjoyable and encounter teachers who communicate this enjoyment'.

The draft senior secondary mathematics curriculum provides four different kinds of mathematics subjects to accommodate the needs of all students who would like to study mathematics to Year 12. The 'specialist' strand is designed for students with a strong interest in mathematics including those intending to study mathematics, physical sciences or engineering at university.

The science curriculum aims to 'provide students with a solid foundation in science knowledge, understanding, skills and values on which further learning and adult life can be built' and 'foster an interest in science and a curiosity and willingness to speculate about and explore the world'.

The draft senior science curriculum includes four learning areas: biology, physics, chemistry, and earth and environmental science.

Australian Government initiatives to advance school science and maths education include:

- building more than 300 science and language centres in Building the Education Revolution
- the Primary Connections program, which is developing and delivering teacher professional learning, curriculum and other resources to elevate science education in primary schools
- the Science by Doing project run by the Australian Academy of Science, which is developing a new approach to science teaching and learning for the junior secondary years emphasising student investigations, inquiry-based learning and scientific thinking

- the TIMES project managed by the Australian Mathematical Sciences Institute, which aims to provide an integrated approach to:
 - increasing mathematics achievement in low socioeconomic status communities
 - developing innovative resources to support the national mathematics curriculum
 - raising awareness of career opportunities in occupations and professions requiring mathematics skills
- the Science and Technology Education Leveraging Relevance program being piloted in 185 schools nationally. The program, developed by the Australian Academy of Technological Sciences and Engineering, is aimed at encouraging students to study science in senior secondary years. Corporate sponsorship has been provided by Rio Tinto and Orica.

Given substantial implementation of the Australian curriculum will not occur until at least the end of 2013 and it will take some years before the benefits can be realised, the Taskforce considers it is necessary to take more immediate action to increase students' participation in science and mathematics.

RECOMMENDATION 6.5

That the Australian and state and territory governments continue to work together on strategies to urgently increase senior school students' participation, attainment and engagement in mathematics and science, noting these subjects open the door to careers in the resources and construction sectors.

16. Address the need for affordable housing and better community infrastructure

This chapter identifies the need to address housing and infrastructure issues in communities that support resources operations.

The rapidly rising cost of housing in mining communities such as Karratha and cities like Darwin and Perth, is perhaps the most frequent complaint associated with the expansion of the resources sector.

Over the 12 months to March 2010:

- the average housing price in Karratha increased from \$632,354 to \$888,900 (Pilbara Development Commission 2010)
- the median price of housing in Darwin increased from \$432,000 to \$540,000 (Northern Territory Treasury 2010)
- housing affordability declined by 28.7 per cent nationally, by 32.7 per cent in Perth, and by 33.4 per cent in regional Western Australia (HIA 2010).

The drop in affordability is partly explained by outside factors such as interest rate rises but it also reflects the impact of population increases in mining communities and nearby cities.

These rising housing costs are making it difficult for resources companies, service businesses, local governments and public services to attract staff. It is increasing costs for resources companies and affecting the sustainability of important community services. Housing price rises not only affect mining and construction workers but doctors, nurses, teachers, child care workers, taxi drivers, hospitality staff and others who make a community viable.

Submissions noted the impact on resources operations:

The biggest impediment (to job seekers moving to take up resources jobs) has been the availability of affordable housing, especially in towns adjacent to resource operations. In some instances, such as Moranbah, it is not just the lack of affordable housing, but the lack of housing at all, at any price, which has resulted in caravan parks overflowing and people sleeping in their cars.

Bundaberg/Hervey Bay Local Employment Coordinator submission

Poorly funded education and health services, chronic housing shortages, and inadequate transport and communication links severely disadvantage many communities and act as a major deterrent to workers and their families locating in these communities.

MCA, CMEWA and QRC submission

They also noted the impact on other sectors of the community:

...in Mt Isa where there is only one mining company, the company refused to pay rents higher than \$500 per week. In our region (Mackay) it is a Dutch auction with rents up to \$1,800 per week. Low paid industry workers cannot afford to live in these communities.

MAIN Cooperative Ltd submission

The Pilbara Association of Non Government Organisations reports that Pilbara rents are around 65 per cent of the average wage of human services workers, which makes it difficult to attract staff to the region (Laurie, 2008).

Housing market dynamics are created by a complex interaction of factors related to supply, demand, the existence of established housing markets, and the volatility of resources sector employment. While some towns, including many in Queensland, have well-established housing markets, others have more volatility and have greater constraints on land release.

Governments are aware of this problem and are now taking steps to address it.

Western Australia and Queensland

The Government of Western Australia's November 2009 'Pilbara Cities' blueprint aims to transform the Pilbara region by creating higher density centres. Under the plan, new high rise housing precincts will be supplemented by the development of new services and facilities, including new marinas, schools, TAFES, hospitals, medical centres and leisure facilities. The blueprint will be funded in partnership between governments and the private sector.

The blueprint provides opportunities for public-private sector partnerships in the delivery of innovative accommodation solutions. For example, a new 100-home village comprising one, two and three bedroom modular units is being built in Karratha. The village is expected to deliver rents in the range of \$350 to \$400 per week for service workers.

As part of the Blueprint, the Government of Western Australia recently released approximately 60ha of land for residential accommodation and community use in South Hedland and around 450 housing lots in Karratha.

The Queensland Government's Sustainable Resources Communities Policy aims to strengthen the government's policy coordination role and improve the linkages between social impact statements and regional planning. A planned Major Projects Housing Policy to address the availability and supply of housing to support major projects has yet to be completed.

The Australian Government is working with state and territory governments to address housing affordability, particularly for low-income earners, including Indigenous people.

COAG's National Affordable Housing Agreement and the Australian Government's National Rental Affordability Scheme are now starting to improve housing affordability in mining communities. For example:

- The Mackay Regional Council has received \$8.5 million from the Housing Affordability Fund to build infrastructure, undertake investigation and consultation into housing density options and to instigate necessary planning scheme amendments to facilitate a new housing development. The initiative is expected to reduce the cost of housing by \$20,000 for 400 home buyers.
- Under the National Rental Affordability Scheme, more than 1,000 affordable rental homes will be built in Perth and southern Western Australia. Homes under the scheme are rented out for at least 20 per cent below market rate to tenants who meet income eligibility requirements—including key workers such as nurses, child care workers and police officers.

The Taskforce acknowledges mining companies can make significant efforts to improve the supply of accommodation for their workers, and also assist government and community sector organisations by providing fully or partially subsidised accommodation for child care workers, teachers, and medical staff.

Direct company investment in accommodation and social infrastructure, once a common feature of mining operations in many parts of Australia, is less frequent today. The volatility of commodity prices makes such investments less viable. This is illustrated by BHP Billiton's Ravensthorpe Nickel Project in Western Australia, which was developed as a residential operation with employees living in the nearby coastal town of Hopetoun. The collapse of the world price of nickel in 2009 following the global financial crisis led to the closure of the mine after less than 12 months of operation. Fortunately for the local community, the mine has since been purchased by another company with plans to recommence operations and employ up to 600 people.

Ravensthorpe illustrates in a dramatic way the risk to companies of investing in infrastructure and the advantages of FIFO. The Taskforce is firmly of the view that FIFO is an important part of the solution for many communities as it reduces the intensity of demand for housing. It is particularly appropriate in operations with a short life.

However, the Taskforce also recognises that in regions like the Pilbara and Kalgoorlie, and in the Surat and Bowen Basins in Queensland, there is a need to address the supply of housing and related infrastructure including 'hard' infrastructure like roads, electricity and water supply, and 'soft' infrastructure like childcare and health services. These are fundamental to maintaining a standard of living for residents, and play an important role in helping companies to attract and retain workers:

Skills and skills shortages correlate strongly with the liveability of the communities in which member companies operate. The 'liveability' of resource communities is a key priority area for industry. Social services and infrastructure such as health, education, child care, emergency services, and housing are crucial to enhancing the sector's capacity to attract and retain a skilled workforce, as well as maintaining the sector's social licence to operate.

MCA, CMEWA and QRC submission

The Taskforce urges state and territory governments to address housing issues in regions affected by resources operations, not only in remote locations but in cities like Darwin and Perth.

The Australian Government is also urged to consider assisting state governments with pressing infrastructure issues in rural, regional and remote centres that support resources operations.

RECOMMENDATION 7.1

That state and territory governments urgently address housing shortages in regions affected by resources operations and in feeder cities such as Darwin and Perth.

RECOMMENDATION 7.2

That the Australian Government give consideration to funding infrastructure needs in regions affected by resources operations.

Appendix I—Terms of reference

1. Develop a comprehensive workforce development plan (the Plan) taking into account the planned major resource, energy and related infrastructure projects in Australia and their employment and skill requirements. This will include:
 - Examining the projects that are coming on stream over the next five years; mapping the geographic location of jobs, the number and type of jobs, the skills and quantity needed for nominated durations; when workers will be required; what skill needs can currently be met.
 - Recognising that Australian Government cannot direct proponents as to the timing of their projects, the analysis should also map the proposed timing and sequencing of project construction with the view to provide the best possible pipeline of labour and skills possible to meet these needs.
 - An analysis of the expected supply of skilled labour from domestic and skilled migration sources and an analysis of the resulting labour or skill gaps. This work would build on industry skills surveys already undertaken (such as for the mining industry in late 2008) and state skill plans.
 - An analysis of the current focus of existing education and training programs and recommendations where appropriate for future initiatives.
 - An analysis of the initiatives already underway by industry collectively and individually to address labour and skill requirements, including initiatives focused on indigenous engagement.
 - Consideration of the mobility of skills and the importance of FIFO skilled workers.
2. Develop a plan that addresses labour and skill shortage issues in the resources sector. This should include:
 - harnessing existing education and training sector capacity
 - identifying the role of skilled migration programs
 - maximising employment and training opportunities for local communities, especially Indigenous people
 - utilising employment services providers to ensure assistance to get unemployed people or retrenched workers into jobs, including increasing labour mobility
 - upskilling or multiskilling through modified, innovative and accelerated trades and engineering qualification pathways
 - removing jurisdictional barriers in trade qualifications (national skills recognition), particularly electrical/instrumentation and gas plumbing
 - other measures that could improve national labour mobility, including strategies to reduce associated impacts on families
 - recognising the requirement for FIFO workers
 - recognising the important role of offshore fabrication
 - housing, land release and social infrastructure in affected communities.
3. Work with companies to develop the plan and to ensure each company has strategies in place to secure the skills and labour required.
4. Broker arrangements with state and territory governments to ensure a responsive training system.

Deliverables

1. Analysis of resources sector labour and skill needs on a national basis over the next five years.
2. Analysis of the expected supply of skilled labour from domestic and skilled migration sources.
3. Analysis of the education and training sector's capacity to meet the needs.
4. Recommendations to address the gaps.
5. Templates to assist companies develop effective skills and workforce plans.

Appendix II—Taskforce and Reference Group Members

TASKFORCE

The Hon Gary Gray AO, MP (Chair)	Parliamentary Secretary for Western and Northern Australia
Senator Glenn Sterle (Deputy Chair)	Senator for Western Australia
Ms Kathryn Campbell	Department of Education, Employment and Workplace Relations
Mr John Hartwell	Department of Resources, Energy & Tourism
Mr Kruno Kukoc	Department of Immigration and Citizenship
Ms Stephanie Foster	Department of Infrastructure, Transport, Regional Development and Local Government
Mr Rod Camm	Skills Queensland
Dr Ruth Shean	Department of Training and Workforce Development, Western Australia
Mr Philip Bullock	Skills Australia
Mr Ken Scott-Mackenzie	Macmahon Holdings Ltd

INDUSTRY REFERENCE GROUP

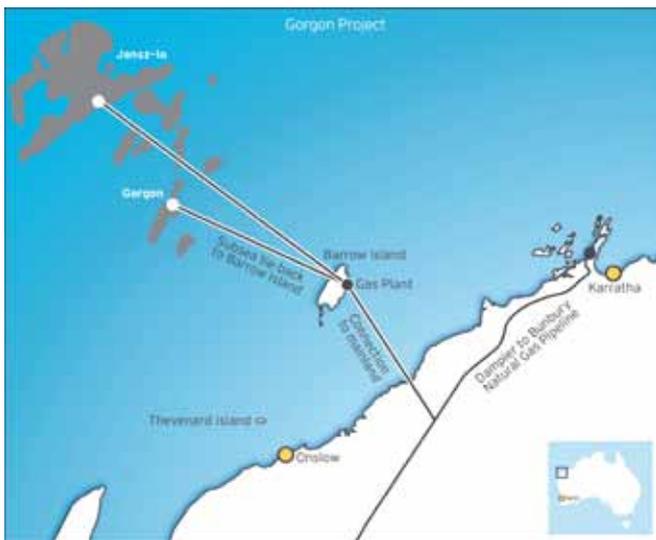
Ms Belinda Robinson	Australian Petroleum Production & Exploration Association
Mr Chris Fraser	Minerals Council of Australia
Mr Jim Barrett	Australian Constructors Association
Mr John Sutton	Construction, Forestry, Mining and Energy Union
Mr Jeff Lawrence	Australian Council of Trade Unions
Mr Paul Howes	Australian Workers Union
Mr Dave Oliver	Australian Manufacturing Workers Union
Ms Minna Knight	Australian Mines and Metals Association

SKILLS REFERENCE GROUP

Dr Glenn Withers AO	Universities Australia
Mr James Barron	Group Training Australia
Mr Ray Barker	SkillsDMC
Mr Tony Noonan	Doorn-Djil Yoordaning Mining & Construction
Mr Andrew Smith	Australian Council for Private Education & Training
Mr Martin Riordan	TAFE Directors Australia

Appendix III—The Gorgon Project

The Gorgon Project is one of the world's largest natural gas projects and the largest single resource natural gas project in Australia's history. The project is operated by an Australian subsidiary of Chevron and is a joint venture of the Australian subsidiaries of Chevron (approximately 47 per cent), ExxonMobil (25 per cent) and Shell (25 per cent), Osaka Gas (1.25 per cent), Tokyo Gas (one per cent) and Chubu Electric Power (0.417 per cent). Project investment is long term, with the plant expected to supply LNG for export and natural gas for local use for 25 years and beyond. According to Chevron's website, the resource being tapped is 25 per cent of Australia's known gas reserves and contains about 40 trillion cubic feet LNG which is enough to power a city of 1 million people for 800 years.



The Gorgon Project will develop the Greater Gorgon Area gas fields off the north-west coast of Western Australia. 'Greater Gorgon' refers to a grouping of several gas fields, including Gorgon, Chandon, Geryon, Orthrus, Maenad, Eurytion, Urania, Chrysaor, Dionysus, Jansz/lo, and West Tryal Rocks, situated in the Barrow sub-basin. The Gorgon field is centered about 130 kilometres off the north-west coast of Western Australia, where the water depth is approximately 200 metres. Other fields in the group

lie to the north, such as Jansz-lo, which covers an area of 2,000 square kilometres in a water depth of 1,300 metres. Barrow Island lies off the Pilbara coast, 85 kilometres north-north-east of Onslow and 140 kilometres west of Karratha and is 25 kilometres long and 10 kilometres wide, covering 235 square kilometres. Using initially 18 wells, gas will be extracted from the Gorgon and Jansz-lo fields and delivered via subsea gathering systems and pipelines to the north-west coast of Barrow Island, then via an underground pipeline system to gas treatment and liquefaction facilities on the island's south-east coast.

The project involves the construction of a 15 million tonne per annum LNG plant on Barrow Island and a domestic gas plant with the capacity to provide 300 terajoules per day to supply gas to Western Australia. The plant will consist of 3 LNG trains (liquefaction and purification facilities), each capable of producing a nominal capacity of five million tonnes per annum (MTPA). Carbon dioxide which comprises around 15 per cent of the raw gas stream, will be stripped out then injected into formations deep below the island. LNG and condensate initially stored in onshore tanks, will be offloaded from a 2.1 kilometre jetty onto LNG carriers and oil tankers, for delivery to overseas customers. Natural gas for domestic use will be exported by a 70 kilometre subsea pipeline to the mainland, for transmission to local customers. The Project's official groundbreaking occurred in late 2009 and construction is expected to take around five years to complete with first gas in 2014.

Barrow Island is listed as a Class A nature reserve with many unique species native to the island and the environment must be preserved and protected. A modular construction approach has been adopted to reduce the impact of the project construction on the Island. Stringent environmental quarantine regulations apply to all buildings, materials and equipment introduced to Barrow Island. Given the offshore location of Barrow Island, plant and materials will be transported direct to Barrow Island from overseas suppliers or from project supply bases located in Perth and Dampier. All components or equipment for use on Barrow Island will be subject to stringent quarantine standards.

Employment and local content

Gorgon is the single largest ever Australian resource investment. By early 2010 it has already committed to more than \$7 billion in investment in local goods and services and was responsible for around 3,000 jobs in Australia.

These jobs are in Perth—spread right through the metropolitan area including Fremantle, Henderson, Spearwood, Bassendean, Redcliffe, O’Connor and South Guildford—in the Pilbara at Dampier and on Barrow Island, and across Australia.

The Project is expected to spend about \$20 billion on Australian goods and services over the next four to five years.

It is estimated that the Gorgon Project will provide up to 10,000 direct and indirect employment opportunities at peak construction. Direct workers are directly involved in the production of goods or services. Indirect workers may oversee others or are in facilitation roles such as human resources officers and contract managers. At the time of writing, there are around 600 workers on Barrow Island. Construction of a 3,000-plus person accommodation village on Barrow Island is also currently underway.

The project planning indicates there are over **1000 different skilled jobs and professions** required to complete this highly technical and complex project. The phases of the Gorgon Project include off site prefabrication for many parts of the LNG plant and the construction camp, transport and installation; construction of the accommodation village, the LNG plant and a 2.1 kilometre jetty and materials handling facilities on Barrow Island (civil and marine engineering works, site preparation, roadworks, construction, logistics and warehousing, telecommunications, electrical and instrumentation work); construction of mainland harbour and storage facilities; marine, subsea and pipeline construction and off shore drilling in the gasfields phase of the project.

A large number of construction skills will be required in the areas of concreting, rigging, carpentry, pipe fitting, boilermaking and welding of all types, steel fixing, insulation lagging, painting, fencing, crane and plant operating and truck driving. There are many specialised roles in marine/undersea construction and LNG plant operations that will require experienced workers.

The full range of support services have been contracted to sustain the project and the workforce such as utilities, transport, quarantine and environmental control, security, medical care, catering, cleaning and waste removal and maintenance. The Gorgon Project workforce will be located mostly on Barrow Island, and in Karratha and Perth.

After Gorgon construction is completed, the workforce of around 500 will maintain the LNG and natural gas supply at the plant on Barrow Island and in administration in Perth.

Gorgon contractors—Australian and global

The following Gorgon Project contracts have been awarded. The variety of contracts illustrates the technical scope and complexity of the Gorgon project and value of the contracts indicates their impact on the economy. Contracts awarded to tenders with significant Australian content are marked with an asterisk (*).

Horizontal Directional Drilling*

New South Wales driller AJ Lucas will install feed gas pipelines via Horizontal Directional Drilling on Barrow Island under an AUD \$95 million contract.

Barrow Island supply base and logistics*

Toll Group is providing supply base and logistics services on Barrow Island. The contract, valued at approximately AUD \$200 million, includes the receipt, warehousing and movement of goods once they are delivered to Barrow Island. It also includes the provision of a waste removal service and cleaning services.

Barrow Island construction village for 3,300 workers*

Three well known engineering construction companies—Thiess Pty Ltd, Decmil Australia and Kentz—have joined forces to create the TDK Joint Venture which has been awarded the construction village contract on Barrow Island.

Under the contract, valued at about AUD \$500 million, TDK will design, manufacture, deliver and commission a 3,300-bed village for personnel working on the Gorgon Project.

Site development*

Perth-based Ertech Pty Ltd is undertaking various site development activities on Barrow Island valued at about AUD \$108 million. The work comprises various construction activities on Barrow Island including marine and onshore works, road improvements, earthworks, water facilities and telecommunications tower installations.

Site preparation*

Thiess Pty Ltd (based in Queensland) has been contracted to provide site preparation and temporary construction facilities on Barrow Island. The contract, valued at approximately AUD \$500 million, involves site preparation for the LNG plant and an expansion of logistics infrastructure on the island.

Facilities management and water treatment facility*

Western Australian engineering group Monadelphous has been awarded an AUD \$60 million contract to manage, operate and maintain construction facilities and utilities on Barrow Island. A later contract amendment was issued to construct a water treatment facility for the Gorgon project on Barrow Island.

Medical services*

Medibank Health Solutions subsidiary Health Services Australia based in Victoria has been awarded a five year AUD \$20 million contract to provide medical services for Chevron on Barrow and Thevenard Islands.

Desalination plants*

South Australian firm Osmoflo is building four reverse osmosis desalination plants for the Gorgon Project. The plants will service the construction and longer term needs of LNG processing, including providing potable water for drinking and general needs.

Truck trailers*

Howard Porter at Spearwood WA built the 320 truck trailers to move plant and equipment to the Pilbara and on Barrow Island, under an AUD \$20 million deal. Owner Roy Lombardi said he had employed 60 new workers and the contract was great news for the local economy.

Air Transport*

Cobham Aviation Services Australia is servicing Chevron Australia's northwest operations, including the Gorgon Project. Under a six-year AUD \$170 million contract, Cobham will operate two RJ100 jets and three 146-seater BAe aircraft. Bristow Helicopters Australia will also provide helicopters to Chevron under a six-and-a-half year AUD \$200 million contract.

Mainland supply base operations and transportation services*

International company Agility Project Logistics is providing supply base operations and transportation services for the Gorgon Project. The contract, valued at approximately AUD \$160 million, involves the supply of personnel and equipment to manage the Project's supply bases and to provide road transport between Perth and Dampier for materials associated with the Gorgon Project.

Integrated logistics services*

DB Schenker, a leading international provider of logistics services, has been awarded the contract to provide integrated logistics services for the Gorgon Project. The five-year contract is for the provision of road and sea chartering services, air transport of international and domestic freight, including courier/warehousing options as well as consolidation of materials and equipment.

Marine Monitoring*

Sinclair Knight Merz has been awarded an AUD \$113 million contract to undertake monitoring of the marine environment around Barrow Island during and after marine facilities construction work for the Gorgon Project.

Pre-assembled racks/LNG Jetty and Marine Structures*

The Saipem Leighton Consortium has been issued an AUD \$150 variation for work relating to the design, fabrication and installation of Pre-assembled Racks (PARs) for the 2.1 kilometre Gorgon LNG Jetty, in addition to the original AUD \$900 million dollar scope.

Cryogenic heat exchangers

Air Products will provide the Gorgon Project's three main cryogenic heat exchangers.

Pre-commissioning

BJ Services has been awarded a US \$80 million contract to provide pre-commissioning services associated with the Gorgon Project.

Standby power

MTU Detroit Diesel was awarded a contract to provide standby power for the Gorgon Project.

Subsea umbilicals

Aker Solutions was awarded a contract for the supply of subsea umbilicals and associated equipment for the Gorgon Project.

Pipe racks

Offshore Oil Engineering Co., Ltd, an affiliate company of China National Offshore Oil Corporation (CNOOC), has been awarded a US \$180 million contract for the fabrication of pipe rack modules for the Gorgon Project.

PT McDermott has been awarded a US \$150 million contract for pre-assembled racks and units for the Gorgon Project.

Appendix IV—Schedule of advanced and less advanced projects by state

See AppendixIV.pdf

Appendix V—Taskforce process and personnel

The Prime Minister announced the establishment of the National Resources Sector Employment Taskforce on 1 September 2009. The Hon Gary Gray AO MP, the Parliamentary Secretary for Western and Northern Australia, was appointed as Chair of the Taskforce. Senator Glenn Sterle was appointed Deputy Chair.

The terms of reference for the Taskforce are set out at Appendix I. The members of the Taskforce and its industry and skills reference groups are at Appendix II.

The Taskforce was required to report to the Minister for Resources and Energy, the Hon Martin Ferguson AC MP and the Minister for Employment Participation, Senator the Hon Mark Arbib, by mid-2010.

The Taskforce released the Resourcing the Future Discussion Paper on 1 March 2010 to initiate the formal consultation and submission process. The discussion paper is available at: www.deewr.gov.au/Skills/Programs/National/nrset/Pages/ResourcingtheFuture.aspx

During March and April 2010 the Taskforce held consultations in mainland capital cities, as well as Mackay, Cairns, Gladstone, and Karratha. Taskforce meetings were attended by a wide range of stakeholders, including mining and construction sector representatives, human resources professionals, unions, peak bodies, education and training sector representatives, state and territory governments, local business interests and private individuals (see Appendix VI).

The Taskforce invited submissions in response to the discussion paper. Submissions were due by 9 April 2010, but the Taskforce accepted late submissions until 26 May 2010. Ninety-seven submissions were received (see Appendix VII and VIII). The submissions are available online at: www.deewr.gov.au/Skills/Programs/National/nrset/Pages/Submissions.aspx

The Taskforce also surveyed resources, construction and labour hire companies working in the sector to gather detailed information about their skills and labour needs. The response rate was too low to use for quantitative analysis, however, the information provided some useful information about the skills required and where recruitment difficulties exist.

The Taskforce also commissioned the NCVET to project the supply of tradespeople over the five years from 2010 to 2015.

Secretariat

Secretariat support for the Taskforce was provided by DEEWR. Officers were seconded to the secretariat from the Department of Resources, Energy and Tourism (DRET), the Department of Immigration and Citizenship (DIAC) and the Department of Infrastructure, Transport, Regional Development and Local Government (DITRD LG).

The secretariat members were Nicky Govan (who replaced Anne Baly from 29 January 2010); Julie Birmingham; Paul Mills; Jennie Breen (DITRD LG); David Drummond (DIAC); David Stroud; Claire Baldwin; Carolyn Dunn; Mark Bravini; Penny Costello; Lauren Anderson (DRET); Sarah Emmerson; Elspeth Trautwein (who replaced Lianne Oliver from 29 January 2010); and Elizabeth Counsel. The Taskforce was also assisted by Astrida Upitsis, Nick Mowbray, Sandra Neil and Cherimoya Violi.

Appendix VI—Consultation attendees

ADELAIDE: 1 MARCH 2010

1. Australian Manufacturing Workers Union (AMWU)
2. ATEC Group Training
3. Australian Mines and Metals Association (AMMA)
4. Built Environs Pty Ltd
5. Complete Personnel
6. Construction and Industry Training Centre Inc
7. Department of Education, Employment and Workplace Relations
8. Exact Mining Services
9. Flinders University
10. Hays Recruiting
11. ICE Engineering & Construction
12. Iluka Resources Ltd
13. Local Employment Coordinator
14. Mps People Solutions
15. National Centre for Vocational Education Research (NCVER)
16. Office of the Training and Skills Commission
17. PEER VEET
18. Resources and Engineering Skills Alliance
19. SA Unions
20. SAGE Didactic
21. Santos Ltd
22. Service to Youth Council Inc
23. Sinclair Knight Merz
24. SkillsDMC
25. South Australian Chamber of Mines and Energy
26. TAFE South Australia Regional
27. University of South Australia

MELBOURNE: 2 MARCH 2010

1. Apprenticeships Group Australia
2. Bilfinger Berger Services
3. Construction Forestry Mining & Energy Union (CFMEU)
4. Employment Services Holdings Group
5. Iluka Resources Limited
6. IPA Personnel Pty Ltd
7. John Holland Group Pty Ltd
8. Loy Yang Power Ltd
9. Minerals Council of Australia
10. Morgan Consulting Group
11. Newcrest Mining

12. Northgate Minerals
13. Rio Tinto
14. Salvation Army Employment Plus
15. SKILLED Group
16. St Barbara Ltd
17. Transfield Services (Australia) Pty Ltd
18. The Australasian Institute of Mining and Metallurgy (AusIMM)

CANBERRA: 3 MARCH 2010

1. Australian Institute of Petroleum
2. Australian Petroleum Production Exploration Association (APPEA)
3. Australian Chamber of Commerce and Industry
4. Australian Pipeline Industry Association
5. Construction Industry Training Employment Association (CITEA)
6. Construction and Property Service Industry Skills Council
7. Department of Resources, Energy and Tourism
8. ElectroComms and Energy Utilities Industry Skills Council Ltd
9. Engineers Australia
10. Housing Industry Association
11. Master Builders Association Australia
12. Minerals Council of Australia
13. National Engineering
14. The Australian National University

SYDNEY: 4 MARCH 2010

1. Australian Industry Group
2. Association of Consulting Engineers Australia
3. Association of Professional Engineers, Scientists & Managers
4. Daracon Engineering Pty Ltd
5. Department of Immigration and Citizenship
6. Downer EDI Engineering
7. Hunter Valley Training Company
8. Job Find
9. Job Futures
10. NSW Minerals Council
11. R/ID Hunter Institute
12. Rio Tinto
13. Tognetti Consulting Pty Ltd
14. Toni Wren
15. Unions NSW, Australia Council of Trade Unions (ACTU)
16. University of Technology Sydney
17. Xstrata Coal

BRISBANE: 5 MARCH 2010

1. Australian Manufacturing Workers Union (AMWU)
2. Arrow Energy
3. Boulderstone Queensland
4. Chandler MacLeod
5. Department of Education, Employment and Workplace Relations (Queensland office)
6. Department of Education and Training
7. Department of Immigration and Citizenship
8. Downer EDI Engineering
9. Energy Skills Queensland
10. Workpac
11. Hastings Deering
12. Manpower
13. MAX Employment
14. Monadelphous
15. New Hope Coal Australia
16. NPC Training
17. Office for Women (Queensland Government)
18. Origin Energy
19. Peabody Energy
20. Queensland Major Contractors Association/ABI Group
21. QSU
22. Queensland Council of Unions
23. Queensland Gas Company
24. Queensland Resources Council
25. Rio Tinto
26. Santos Limited
27. Sarina Russo Job Access
28. Sedgman Coal
29. Steel Fabrications Australia
30. Thiess
31. Tradesrecognition.com
32. Workpac
33. Xstract Mining Consultants

DARWIN: 24 MARCH 2010

1. Australian Manufacturing Workers Union (AMWU)
2. Arafura Resources
3. Charles Darwin University
4. Department of Education, Employment & Workplace Relations
5. Group Training Northern Territory Ltd (GTNT)
6. HAR Resources P/L
7. Industry Capability Network
8. INPEX

9. IS Australia
10. Job Futures Ltd (Ironbark Employment)
11. Jobfind Centres Australia
12. Larrakia Development Corporation (LDC)
13. Master Builders NT
14. Minerals Council of Australia
15. OzHelp Foundation
16. Unions NT

CAIRNS: 25 MARCH 2010

1. Advance Cairns
2. Australasia Drilling Institute
3. Cairns Chamber of Commerce
4. Centre for Rural and Remote Mental Health
5. Cummings Economics
6. Dawson Engineering
7. Department of Employment, Economic Development and Innovation
8. ITEC Employment
9. James Cook University
10. Local Employment Coordinator
11. MacDonnells Law
12. Quality Innovation Training and Employment (QITE)
13. Queensland Nickel
14. Queensland Resources Council
15. Skill360 Australia
16. Skills Queensland
17. TAFE Far North Queensland
18. Xstrata Australia Copper

MACKAY: 26 MARCH 2010

1. Axial
2. BHP Billiton Mitsubishi Alliance
3. Capricornia Training Company Ltd
4. G & S Engineering Services
5. Gladstone Area Group Apprentices Ltd
6. Mackay Region Apprentice Employment
7. Melco Engineering
8. Member for Capricornia
9. Member for Dawson
10. Queensland Resources Council
11. Regional Economic Development Corporation
12. Skills Queensland
13. The Salvation Army Employment Plus
14. Vale

PERTH: 30 MARCH 2010

1. Aditya Birla Minerals Ltd
2. Australian Manufacturing Workers Union (AMWU)
3. Apache Energy
4. API
5. Australian Petroleum Production Exploration Association (APPEA)
6. Ashburton Aboriginal Corporation
7. Communications Electrical Plumbing Union (CEPU)
8. Curtin University of Technology
9. Department of Immigration and Citizenship
10. Department of Infrastructure, Transport and Regional Development
11. Department of Resources, Energy and Tourism
12. Dept of Training and Workforce Development
13. Doorn-Djil Yoordaning Mining and Construction
14. Group Training Australia WA
15. John Curtin Institute of Public Policy
16. John Holland
17. National Employment Services Association
18. Newmont Asia Pacific
19. Ngarda Civil & Mining
20. Pit Crew Management Consulting Services Pty Ltd
21. Polytechnic West
22. PVS Workfind
23. Recruitment Manager
24. Resources and Minerals Training Council
25. Salvation Army Employment Plus
26. Silver Trowel Trade Training
27. Skills Australia
28. The Chamber of Minerals and Energy of Western Australia
29. University of Western Australia
30. Westrac
31. Woodside Energy
32. Worley Parsons

KARRATHA: 31 MARCH 2010

1. CITIC Pacific Mining
2. CRS Australia
3. Foster Wheeler Worley Parsons
4. OzHelp Foundation
5. Pilbara Aboriginal Contractors Association
6. Pilbara TAFE
7. Port Hedland Shire
8. Rio Tinto
9. WA Health—Port Hedland

GLADSTONE: 20 APRIL 2010

1. Australian Petroleum Production & Exploration Association
2. Central Queensland University
3. Department of Employment, Economic Development & Innovation
4. Department of Education and Training
5. Deputy Principal Tannum Sands State High School East Queensland
6. Gladstone Economic and Industry Development Board
7. Gladstone Area Group Apprentices
8. Gladstone Area Promotion Development Ltd
9. Gladstone Engineering Alliance
10. Gladstone Industry Leaders Group
11. Gladstone Ports Corporation
12. Gladstone Regional Council
13. NRG Gladstone
14. Origin
15. QER Pty Ltd
16. QGC - a BG Group Business
17. Queensland Resources Council
18. Rio Tinto Alcan
19. Shell
20. Wiggins Island Coal Terminal Pty Ltd

Appendix VII—List of submissions received

The Taskforce received 97 submissions. These are summarised at Appendix V and available in full at www.deewr.gov.au/nrset.

1. Adult Multicultural Education Services
2. Association of Professional Engineers, Scientists & Managers, Australia
3. Australasian Drilling Institute Pty Ltd
4. Australasian Institute of Mining and Metallurgy
5. Australasian Institute of Mining and Metallurgy, Illawarra Branch
6. Australian Institute of Marine and Power Engineers
7. Australian Council of Trade Unions
8. Australian Council for Private Education and Training
9. Australian Industry Group and Australian Constructors Association
10. Australian Institute of Management
11. Australian Manufacturing Workers' Union
12. Australian Medical Association, Western Australia
13. Australian Pacific LNG
14. Australian Petroleum Production and Exploration Association
15. Australian Pipeline Industry Association
16. Australian Shipowners Association
17. Australian Steel Institute
18. Australian Technology Network of Universities
19. BeNext
20. BP Australia
21. Cairns Chamber of Commerce and Cairns Advance
22. Carol O'Donnell (private citizen)
23. Chamber of Commerce and Industry Queensland
24. Chamber of Commerce and Industry Western Australia
25. Chandler Macleod Group
26. Charles Darwin University, Vocational Education and Training
27. Charles Darwin University, School of Australian Indigenous Knowledge Systems
28. Chevron Australia Pty Ltd
29. Civil Contractors Federation
30. Coal Services Pty Ltd
31. Communications Electrical Plumbing Union
32. ConocoPhillips
33. Construction and Property Services Industry Skills Council
34. Construction, Forestry, Mining & Energy Union of Australia
35. Cowra Shire Council
36. Cummings Economics
37. Darwin Regional Indigenous Advancement & CDEP Inc
38. Department of Defence
39. Department of Further Education Employment Science and Technology, South Australia

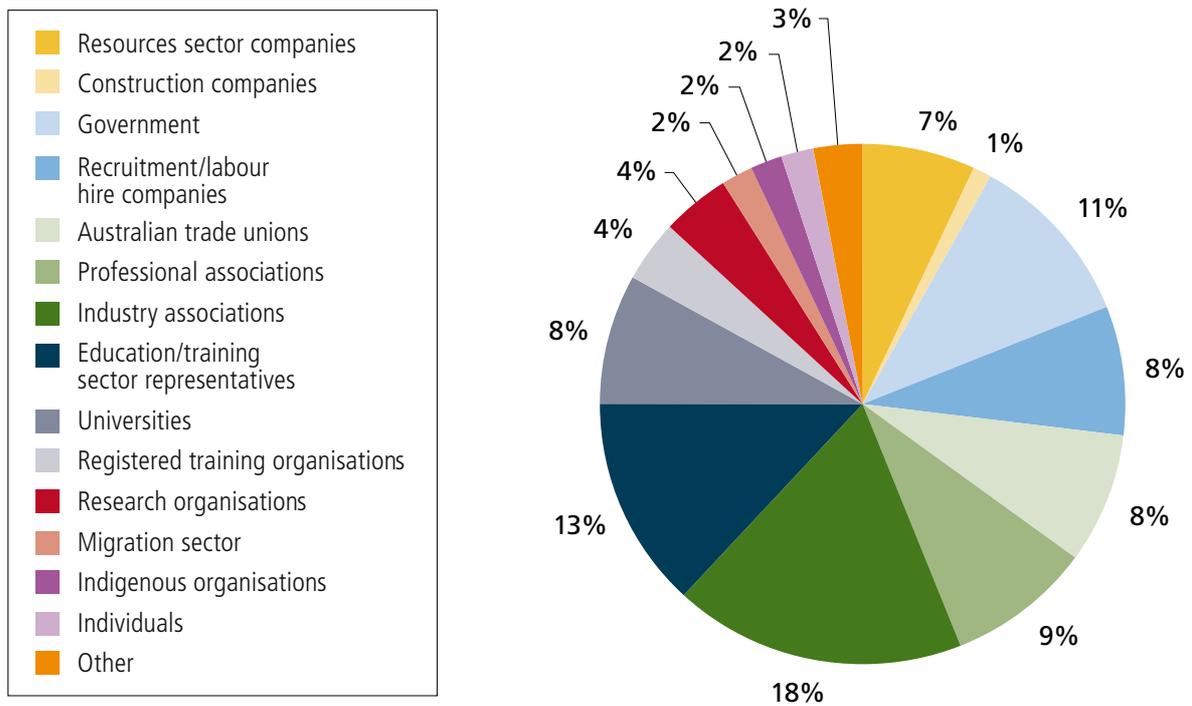
40. Department of Resources, Northern Territory Government
41. East Coast Apprenticeships
42. EE Oz Training Standards
43. Energy Skills Queensland
44. Engineers Australia
45. Fragomen
46. Fuzionscape
47. Goldfields Esperance Development Commission
48. Government of Western Australia—Training and Workforce Development
49. Group Training Australia Ltd
50. Housing Industry Association
51. JobFit Systems International Pty
52. Jobs Australia
53. Kent Corporate Relocation
54. Local Employment Coordinator—Bundaberg/Hervey Bay Priority Area
55. Main Cooperative Ltd
56. Manpower
57. Maritime Union of Australia
58. Master Builders Australia
59. Minerals Council of Australia, Chamber of Minerals and Energy, Western Australia and Queensland Resources Council
60. Mining Education Australia
61. National Centre for Vocational Education Research
62. National Employment Services Association
63. Newcrest Mining Limited
64. Northern Project Contracting
65. NSW Business Chamber
66. NSW Minister for Education and Training, The Hon Verity Firth MP
67. OZHelp Foundation Ltd
68. OZ MINERALS
69. Parker Centre Ltd
70. Pit Crew Management Consulting Services Pty Ltd
71. Professor Peter Hayes, School of Chemical Engineering, University of Queensland
72. Queensland Government—Department of Education and Training
73. Queensland Tourism Industry Council
74. Queensland Major Contractors Association
75. Rio Tinto—Australia
76. RPL Assist
77. Skilled Group
78. Skills Australia
79. SkillsDMC
80. Skills Victoria
81. South Australian Chamber of Mines & Energy (SACOME)
82. TAFE Directors Australia

83. TAFE NSW
84. The Australian Employers' Network on Disability
85. The Australian Workers' Union
86. The Career Industry Council of Australia
87. The Chamber of Minerals and Energy Western Australia
88. The Resource Channel Website
89. The Resources Industry Training Council (RITC)
90. The Australian Institute for Social Research, The University of Adelaide
91. The University of Sydney, Faculty of Engineering and Information Technologies
92. The University of Western Australia
93. The University of Western Australia, Business School
94. Urban Land Development Authority, Queensland
95. Unions NT
96. Universities Australia
97. ValueEdge

Appendix VIII—Summary of submissions received

This is a summary of the 97 submissions received by the Taskforce in response to the *Resourcing the Future Discussion Paper*, which was released on 1 March 2010.

The summary is not intended to be exhaustive, but to highlight some of the key issues raised. The submissions are available in full at www.deewr.gov.au/nrset.



The need for data and information to support workforce planning

A number of submissions raised the need to improve the workforce planning information available to governments and other stakeholders to support sector-wide workforce planning and inform policy decisions by governments. Ideas included requiring companies to provide workforce planning information through state government approvals, conducting skills audits, and undertaking modelling. Many supported the development of an sector wide approach to planning.

Some saw a need for Skills Australia or an alternative body to play a role in a coordinating a national workforce development strategy and/or to monitor employment trends and requirements in the sector.

The demand for labour and skills

Submissions from companies provided information about projects and their associated skills needs, and approaches to workforce planning.

Some submissions raised concerns about the implications for other industries of the expansion of the resources sector, including the potential to cause skills shortages in the construction, residential construction, manufacturing, transport and maritime sectors.

Skills shortages

A quarter of submissions raised concerns about the shortage of skilled, experienced people in a number of occupations, notably mining and petroleum engineering, geologists, geotechnical engineers (including at management levels), electrical tradespeople and welders. There was also concern about highly specialised fields like marine engineering.

Increasing the supply of Labour

Influencing career choices

Influencing students' choice of career was seen as important with some submissions noting a need for better information for job seekers and careers advisers.

Industrial relations

Submissions from unions noted industrial relations was an important factor in meeting skills needs, suggesting companies provide for collective consultations with workforces on all employment arrangements, especially working hours and rosters.

Increasing women's participation

A number of submissions acknowledged women are underrepresented in the resources sector and supported the need to improve women's participation by encouraging more peer support networks and family friendly work arrangements, including provision of child care.

Upskilling existing employees

Some submissions emphasised the need to upskill existing employees to enhance the skills available to the sector and improve retention.

Fly-in fly-out operations

Submissions from employers and industry associations noted the importance of FIFO to many projects. Others noted the challenges of providing training and support in a FIFO environment. Some submissions noted that FIFO should not be seen as a barrier to training—for example, organisations such as the Australian Institute of Management are able to deliver training onsite.

Regional Mobility

A few submissions thought companies should give priority to encouraging workers to relocate. One suggested that employees could be paid relocation bonuses or given tax incentives. Several submissions provided examples of effective relocation strategies.

Labour hire companies

Some submissions noted labour hire companies will have a role to play in providing people in peak periods as well as a brokerage role to navigate the training and recruitment markets.

Migration

There were mixed views about the use of migration to meet skills needs. For example, one submission thought there were opportunities to encourage international students to stay in Australia after they complete their qualifications. In contrast one union considered this inappropriate, and advocated labour market testing for 457 visas. Most submissions acknowledged that migration had a role to play.

Indigenous people

A number of submissions recognised the important role for resources operations in supporting Indigenous employment and business and community development in regional and remote locations and highlighted a range of strategies to support the participation of Indigenous people in the sector.

Offsite fabrication

Some submissions raised the advantages of promoting offsite fabrication, including speedier completion of construction work, reduced requirement for onsite labour, and access to training for employees.

Educating and training to supply the right skills

Some submissions stressed the importance of the education and training system in helping the resources sector to meet its skills needs.

Centres of excellence

There was support for the establishment of 'centres of excellence' for the resources sector. Centres of excellence meant different things to different people in terms of scale, scope and location. There was common emphasis on the need for partnerships to raise the profile and practice of the resources sector through a dedicated focus on supporting educational pathways and career opportunities, upskilling of existing workers, encouraging research to support workforce planning and learning, and sharing leading practice.

Maths and science

Some submissions raised concerns about the low participation in advanced mathematics and science subjects in secondary school, and the implications for the flow through of students through to maths and science related courses.

Literacy and numeracy

Several submissions highlighted problems with low levels of English language literacy and numeracy, which impacts on people's suitability for employment and capacity to upskill.

Mentors

Several submissions saw opportunities to employ former (e.g. retired) tradespeople and older workers as trainers and mentors for new entrants to the sector, especially apprentices.

Recognition of prior learning

A number of submissions highlighted the potential value of recognition of prior learning and suggested efforts be made to improve its use to support skills development in the resources and construction sectors.

Apprenticeships

More than 30 submissions raised issues concerning apprenticeships. Issues raised included:

- the need to increase uptake of apprentices, including by increasing awareness of the opportunities and advantages of VET in schools among parents, students, teachers and employers, addressing employment conditions for apprentices and providing additional incentives for employers
- the need for greater flexibility in apprenticeships and to simplify the funding arrangements

- problems with completions, and the need to provide appropriate support to apprentices who move around on jobs.

Several submissions suggested alternative apprenticeship models including faster, competency-based apprenticeships, 'incubator' arrangements, and institutional pathways. One union suggested requiring employers to maintain a minimum ratio of trade apprentices to tradespeople.

Universities

Submissions from Universities identified the significant support they receive from resources companies, and called for additional funding for infrastructure and/or more sustainable funding arrangements for niche courses like mining engineering. Universities increasingly partner together to offer courses because of viability issues.

Work integrated learning, flexible course delivery, and a strong teaching-research nexus were seen as important.

Interface between vocational education and training and higher education

Some submissions suggested stakeholders should work together to improve the interface between VET and higher education.

Capacity issues

'Thin markets' pose a challenge for some education and training providers, particularly those offering highly specialised courses with few students, and those in regional/remote areas.

There was concern about the availability of trainers and university lecturers, and particular capacity issues in respect of skills for emerging technologies eg. in the extraction of coal seam gas (CSG). Some submissions identified the need for additional infrastructure and resources to help providers meet increasing demand for courses.

Some in the training sector argued vocational degrees should be uncapped in the same way as undergraduate degrees.

Other

Some submissions recognised governments and companies shared the responsibility of developing communities in remote locations near projects.

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Acronyms

AAC	Australian Apprenticeship Centre
ABARE	Australian Bureau of Agricultural and Resource Economics
AIG/ACA	Australian Industry Group/ Australian Constructors Association
ATN	Australian Technology Network
ABS	Australian Bureau of Statistics
ACED	Australian Council of Engineering Deans
ACTU	Australian Council of Trade Unions
AMWU	Australian Manufacturing Workers Union
ANET	Australian National Engineering Taskforce
APESMA	Association of Professional Engineers, Scientists and Managers
APPEA	Australian Petroleum Production & Exploration Association
AQF	Australian Qualifications Framework
AWU	Australian Workers Union
AMWU	Australian Manufacturing Workers Union
BER	Building the Education Revolution
BMA	Billiton Mitsubishi Alliance
CDEP	Community Development Employment Project
CFMEU	Construction, Forestry, Mining and Energy Union
COAG	Council of Australian Governments
CMEWA	Chamber Minerals and Energy of Western Australia
CPSISC	Construction and Property Services Industry Skills Council
CSG-LNG	Coal Seam Gas-Liquefied Natural Gas
CSM-LNG	Coal Seam Methane-Liquefied Natural Gas
DEEWR	Department of Education, Employment and Workplace Relations
DIAC	Department of Immigration and Citizenship
DIDO	Drive-in Drive-out
DITRDLG	Department of Infrastructure, Transport, Regional Development and Local Government
DRET	Department of Resources, Energy & Tourism
EMA	Enterprise Migration Agreement
ENS	Employer Nomination Scheme
ENSOL	Employer Nomination Scheme Occupations List
ESQ	Energy Skills Queensland
FIFO	Fly-In Fly-Out
GAGAL	Gladstone Area Group Apprentices Ltd
GDP	Gross Domestic Product
GTA	Group Training Australia
GTO	Group Training Organisation
GSM	General Skills Migration
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MCA	Minerals Council of Australia
MCE	Ministerial Council on Energy

MCMPR	Ministerial Council for Mineral and Petroleum Resources
MEA	Mining Education Australia
MOU	Memorandum of Understanding
MTEC	Minerals Tertiary Education Council
MCTEE	Ministerial Council for Tertiary Education and Employment
NCVER	National Centre for Vocational Education Research
NESA	National Employment Services Association
NLS	National Licensing System
NRSET	National Resources Sector Employment Taskforce
QMEA	Queensland Minerals and Energy Academy
QRC	Queensland Resources Council
RPL	Recognition of Prior Learning
RCC	Recognition of Current Competencies
RTO	Registered Training Organisation
RITC	Resources Industry Training Council
RBA	Reserve Bank of Australia
RSMS	Regional Sponsored Migration Scheme
SOL	Skilled Occupation List
SVI	Skilled Vacancy Index
TAFE	Technical and Further Education
VET	Vocational Education and Training
WELD	Working on Employment, Learning and Development

