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Susanne Bahn

Rosalyn Cameron

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**SKILLED LABOUR SUPPLY AND DEMAND IN RESOURCE RICH REGIONS OF  
AUSTRALIA**

**\*Dr Susanne Bahn**

*Centre for Innovative Practice  
School of Management  
Edith Cowan University, Australia*  
[s.bahn@ecu.edu.au](mailto:s.bahn@ecu.edu.au)

**Dr Roslyn Cameron**

*School of Management and Marketing  
Central Queensland University, Australia*  
[r.cameron@cqu.edu.au](mailto:r.cameron@cqu.edu.au)

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## **SKILLED LABOUR SUPPLY AND DEMAND IN RESOURCE RICH REGIONS OF AUSTRALIA**

### **ABSTRACT**

The demand for specific skills for the current resources boom in Australia is placing extreme pressure upon the Australian workforce and economy to supply this labour for billion dollar resource sector projects primarily in Western Australia and Central Queensland. This paper is a conceptual think piece which overviews the current demand and supply of specialised labour for the Australian resources sector before presenting two resource rich region case studies. The first is the mining sector in Western Australia and the second is the coal seam gas/liquefied natural gas (CSG/LNG) industry in Central Queensland. This is followed by a mapping of the Australian skilled migration policy terrain before presenting a conceptual framework for future research in this area.

**Key Words:** Skilled migration, resource rich regions, labour demand and supply, mining, energy and construction.

### **INTRODUCTION**

Resource rich nations are at times faced with pressure to supply sufficient and specialised labour in order to meet internal supply and demand. Australia is a resource rich nation with extensive capacity in two states namely Western Australia (WA) and Queensland (Qld) as a result Australia is currently in the midst of labour shortages for workers with specialised skills. This paper explores the issue of skilled migration in Australia, and with particular reference to the demands for those with specialised skills in the resources and energy and construction sectors in Western Australian and Central Queensland. The paper outlines the problem, reviews the literature, presents two cases as examples of the issues and calls for research supported by a conceptual framework. The intention of the paper is to establish preliminary conceptualisation and modelling that supports further study.

Australia has a long history of migration and is considered a traditional migration nation. Several authors have documented the historical context of migration in Australia in their discussions of skilled migration (Hugo, 2004a, 2004b; Phillips, 2005, 2006; Saunders, 2008; Shah & Burke, 2005; Teicher, Shah & Griffin, 2000). Australia's migration policy has been developed as a national policy for over 60 years when in 1945 the first federal immigration portfolio was created. As noted by Hugo and others, migration has and will remain a crucial aspect of Australia's economic, social, and cultural development and future.

There is increasing global competition for highly skilled workers stimulated in part by the demographics of the developed world. Professionals within key workforces (e.g., health, nursing and medicine; engineering and technical/trades) are some of the most sought after occupational groups globally and Australia will need to focus on strategies to attract and retain skilled migrants so as to assist in maintaining a competitive advantage in the "war for talent" and to meet deepening skill shortages.

### **MAPPING THE AUSTRALIAN SKILLED MIGRATION POLICY TERRAIN**

Growth in the Australian construction, energy and resources sectors has driven large projects and created a demand for labour that have specialised skills (BIS Shrapnel, 2009). Although Australia still has workers who are unemployed or sectors such as manufacturing that are under threat of redundancies and labour reductions the skills of these workers are insufficient to meet the current labour demand of the resources sector (National Centre for Vocational Education Research, 2008). This has resulted in what Khoo, McDonald, Voigt-Graf and Hugo (2007) note as a mismatch in labour demand and supply. The skills that are sought are often not available in Australian workers as much of the work requires narrow specialisations, for example: helicopter engineers or designers and maintainers of specialised drilling equipment that is constructed in countries other than Australia. In response, the federal government has recognised that 'the days of unskilled jobs are over' (Ferrari, 2011:5) and increased traineeship and apprenticeship places in the 2011 Federal budget by allocating more than \$100M for the National Workforce Development Fund for training development (Moodie,

2011). In addition, firms operating in Australia have access to overseas skilled workers on Temporary Business (Long Stay) - Standard Business Sponsorship (Subclass 457) visas, Regional Sponsored Migration Schemes (RSMS), Employer Nominated Schemes (ENS) , Enterprise Migration Agreements (EMAs) and Regional Migration Agreements (RMAs).

The Australian government's skilled migration program is dynamic and changing and has undergone a series of major reforms in the last two years. The emphasis is now on the skills occupation list (SOL), state and territory migration plans, priority processing and employer sponsored programs rather than independent and general migration. The policy trend towards a demand driven rather than supply driven migration system, the introduction of the Enterprise Migration Agreements (EMAs), Regional Migration Agreements (RMA) and State and territory Migration Plans will actually benefit industries and businesses wishing to undertake skilled migration strategies for recruitment. The policy emphasis on temporary skilled migration will also benefit resource rich regions such as the Western Australian and Central Queensland mining sector and energy sectors such as is the case in Gladstone, Queensland which is experiencing a substantial and significant demand for skilled workers for the four coal seam and liquefied gas projects, as this provides employees with flexibility.

The skilled migration programs most pertinent to this discussion (providing labour for resource rich regions) are the Sub Class 457 temporary work visa and the newly established Enterprise Migration Agreement (EMA). The 457 skilled migrant visa was introduced as Australian policy in 1996 (Oke, 2010) and allows employers to employ overseas workers to fill nominated skilled positions which they can't fill domestically (DIAC, 2009). Temporary skilled migrants can be on 457 Visas for up to 4 years with an option to move to Permanent Residency after that period. The number of primary 457 visa holders in Australia at 30 June 2011 was 72 030, an increase of 5.3 per cent in comparison with the same date last year. The number of 457 primary visas granted in the financial year ending at the end of June 2011 was 38.2 per cent higher than the same period in the 2009-10 program year. The top three citizenship countries for primary 457 visa grants to 30 June 2011 were the United Kingdom (24.6 %), India (18.2 %) and the United States of America (8.1 %) (DIAC, 2011). Table 1 provides

recent statistics on 457 visas granted in the 2010-11 program year as compared to the 2009-2010 program. The top three occupational groupings and top 3 industries for each of these program periods presented.

*<Insert Table 1 here>*

Enterprise Migration Agreements were introduced in 2010 and 'are a customised-designed, project wide migration agreement for large scale resource projects' (DIAC, 2011). They make available semi-skilled and sub-trade occupations such as riggers and scaffolders but require evidence of why Australian workers cannot be used before approval. The use of EMAs for large resource sector projects across WA and Qld over the immediate future will generate a lot of debate and polarise sections of the community about the use of skilled migration programs for temporary workforce demands. The authors will be closely monitoring this program and its roll out across resource rich regions as they represent an even bigger challenge to the strongly held beliefs about the nature and future of work.

### **SKILLS DEMAND AND SUPPLY IN RESOURCE RICH REGIONS**

A skill shortage as defined by Richardson (2007:8) as 'a source of aggravation to firms and, when acute, it is likely to hamper the quality and quantity of their output'. Sourcing appropriate labour to support the extensive Australian resource projects is paramount to the Australian economy. Cameron (2011) views the causes of skills shortages as complex which cannot be attributed to any single cause but is complex interplay of macro, meso and micro forces.

For example, the value of construction projects alone for the second quarter of 2009 was \$35.03 billion dollars, which is an estimated 15% of GDP (Gruen, 2011). McDonald and Temple (2008) reported on the risks of not meeting labour demand. They argue that the trend of unmet labour demand can lead to fast moving increases in wages as has been evidenced in the states of Queensland and Western Australia where, wages have risen substantially due to the first wave of the resources

boom. Additionally, they note the undersupply of skilled labour presents risks of a delay to major infrastructure projects, environmental improvement and new energy sources that would enhance Australia's long-term productivity (McDonald & Temple, 2008).

In Khoo et al's (2007) study in 2003/04 they determined the fundamental reason employers sourced overseas temporary workers was due to their difficulty in sourcing sufficiently skilled labour in Australia. The emergence of global labour markets and what Hugo (2004a) refers to as an emerging paradigm of international migration highlights the use of skilled migration to supply a specialised workforce. Skilled labour on restricted working visas such as the Sub Class 457 temporary work visa allow for internal labour flexibility through occupational fluidity, contracting, performance based pay and relocation (Standing, 1999). Conversely, many migrants seek work in Australia because they wish to improve their quality of life compared to that of their home country. Many skilled migrants see the 457 visa as a two-step process to permanent residency.

In Australia, opponents to the use of workers on temporary working visas argue that there is an issue of parity of wages compared to the Australian worker (Oke, 2010; Jockel, 2009). However, Maley and Franklin (2008) countered that temporary migrant average wages employed under the Sub Class 457 visa outpaced those of their Australian counterparts. Toner and Woolley (2008) are concerned that the use of temporary labour has an impact on training for Australians and Richards (2006) notes the impact of employment levels of Australian residents and Brooks, Murphy and William (1994) question the skills transfer from migrants to Australian workers. It appears that in recent times skilled labour is highly valued in the resources space and the issue of wages pales compared to the availability and access to skilled labour. Cameron and Harrison (2010) noted that there is no argument that skilled migration is a crucial strategy (albeit not the only strategy) for Australia in combating the human capital imperatives of the 21<sup>st</sup> century, although there are concerns by some that there needs to be further efforts made to develop the home grown skilled labour supply (especially through the vocational education and training sector) and the impact of skilled migration on local wages and unemployment rates (Shah & Burke, 2005).

### **CASE 1: RESOURCE RICH STATE: WA'S MINING SECTOR PROJECTS**

The WA economy is facilitating strong economic growth in Australia and is experiencing a period of rapid production and growth which experts predict is likely to continue for at least the next twenty years (Skills Australia, 2011). The Gorgon Gas project and the expansion of Woodside's Pluto natural gas operations in WA are key examples of large resources projects, fuelled by the world appetite for our minerals and energy sources. Resource projects of this magnitude require large numbers of skilled people. As of the end of April 2011, nationally there were 94 resource projects at an advanced stage of development, either committed or under construction, representing a record level of capital expenditure of \$173.5 billion (ABARE, 2010). This was an increase of 30% on the 72 projects that were at an advanced stage of development in October 2010, with a corresponding capital expenditure of \$133 billion. Of these projects 39 were in WA with a total value of \$109.5 billion (ABARE, 2011). This demand for Australia's minerals and energy supplies is being driven by the rapidly growing Chinese and Indian economies.

As a consequence skilled labour and particularly those with specialised skills are required in large numbers in WA. As a response, the Federal Minister of Immigration, Chris Bowen announced on the 19<sup>th</sup> July 2011, that Perth had been rezoned as a regional area (Butterly, July 2011) and therefore there is no cap on the numbers of workers on 457 visas entering that state. This ensured a significant increase in the numbers of skilled migrants that can now be brought into WA. In addition, the first Australian EMA was granted to Rio Tinto in WA in 2012 (DIAC, 2011) with 1,715 semi-skilled workers being sought from overseas.

### **CASE 2: RESOURCE RICH REGION: THE GLADSTONE CSG/LNG PROJECTS**

The Gladstone Region is currently facing the combined effects of increased business opportunity and increasing competition for the skilled members of its diverse workforce primarily related to the



construction of the infrastructure for the four CSG/LNG projects and related developments. There is already evidence of an emerging two-tier economy within the region with a housing crisis and a loss of existing workers to the new projects. Whilst the Gladstone region and its workforce are familiar with the boom-bust cycles of industrial development the impending number of large infrastructure projects, and the timing of their development, will place unprecedented demands on available skilled labour. The Gladstone region is front and centre of Queensland's evolving economic growth with 35% or some \$45 billion, of investment being delivered in the region. The coincidence of these significant developments will demand a highly skilled workforce (QLD DET, 2011).

Skills Queensland recently released a *Strategic Priorities Issues Paper* in 2011 which put forward four key strategic priorities for future activity as a response to a set of key issues impacting skills development and labour demand in the state. Priority 2 has direct relevance to the purpose of this proposed study:

Priority 2 - meeting the needs of Queensland's resource sector:

- In Queensland, resources sector activity occurs mostly in regional and remote areas. However, regional population growth is not uniform.
- Rapid growth in some regional areas is having adverse impacts on the community in terms of liveability, competition for the supply of labour, and a range of supply chain impacts.
- There needs to be further consideration of strategies to supply the labour needed for major resources projects, including targeting the potential supply, using skilled migration or a temporary or fly-in/fly-out workforce, ensuring job opportunities for local workers, and creating new skills development pathways to fast-track skills for the sector (Skills Queensland, 2011:8).

For the Gladstone region this situation is exacerbated by the demand for labour during the construction phase of the CSG/LNG projects and other developments by existing industry sectors. A crucial element of this will involve both geographic branding and image as well as a strong focus on supportive employers and communities with particular emphasis on resolving the perennial settlement

issues associated with family, housing, schooling, cultural and linguistic challenges faced by skilled migrants and their families locating to regional Australia.

The four CSG/LNG projects in Gladstone are detailed in Table 2 as reported by the Gladstone Economic and Industry development Board (GEIDB) in June 2012.

*<Insert Table 2 here>*

Energy Skills Queensland has been conducting a series of workforce planning research specifically looking at the labour demands of the CSG/LNG industry in Gladstone. To this end they will be developing a dedicated CSG/LNG workforce development strategy. Table 3 details the qualifications that will be in demand for this industry in Gladstone and throughout QLD.

*<Insert Table 3 here>*

## **CONCEPTUAL FRAMEWORK**

Meeting the skills requirements of the large number of resource projects in the state of WA and the locality of Gladstone is a complex issue of supply and demand. The issue of providing adequate specialised skilled workers is paramount to the profitability and sustainability of economic growth in Australia. In order to understand the push-pull factors of supplying sufficient labour we have mapped some of the external forces and the human resource management issues as a conceptual framework for further study in the two figures that follow.

Figure 1 maps some of the external forces that impact on the pressure for the supply of sufficient specialised skilled workers in Australia, for the resource sector in particular. We note that the conceptual framework we have developed is focused on the problem of skilled labour and is pertinent in all other sectors of professional work, however we focus specifically on the resource sector. By no means is this list the full extent of external forces and we acknowledge that it could be extended to better reflect the complexity of the external environment. We have determined that the external forces impacting on the supply of skilled workers in Australia for the resources sector falls within four macro forces: Global Economics, Characteristics of the Resources Sector, Australia's Migration

Policy and National Employment Industrial Relations. Factors that affect global economics include global commodity pressures, labour supply chains and the resources 'boom'. Australia is responding to the boom as the demand for our resources continues through the large global commodity appetites of China and India. Labour supply chains influence the flow of skilled workers globally as specialised skills are sought out for large resource projects. The balance of projects versus specialised skilled workers is currently being tested. The resources sector in Australia is characterised by the mining of base metals and minerals and tapping into oil and gas supplies. Australia's Migration Policy is influenced and regulated by the three tiers of government: Federal, State and Local Government. In Australia, policy is not always managed at the federal level, and individual state jurisdictions have considerable input in areas such as training, health and safety and industrial relations. Conditions of employment in Australia is regulated by Industrial relations policy and influenced by industry associations, employer groups and the Unions.

Figure 2 extends the conceptual framework to focus on the human resource management issues currently being experienced in resource rich regions in Australia and epitomises/magnifies the growing trends in the changing and evolving nature of work. Five thematic areas have been identified that influence the demand and supply of specialised skill shortages in Australia: 1. Global Mobility; 2. National Mobility; 3. Impacts on Regions; 4. Training and; 5. Workforce Diversity, Safety and Wellbeing.

Within the theme of global mobility, steadfastly held views are being challenged about the nature of work and central to this challenge is the increasing mobility of labour globally, nationally and regionally. What is happening in resource rich regions of Australia is challenging the paradigm from the concept of the job for life, training for life and sole occupational career trajectories, to one which will encourage and demand global mobility as a means to meet the demand of specialised skills in resource rich industry sectors.

Recent literature argues that there is increasing complexity in the form of the employment relationships arising from these global labour networks (Rubery, Grimshaw & Marchington, 2010;

Rainnie, Herod & McGrath-Champ, 2011), This complexity is reflected in the fact that a number of workers in the resources sector are contractors. The use of workers on Sub Class 457 temporary work visas and EMAs are global labour market resources that are a positive response to the demand for workers with specialised skills required by projects in resource rich regions.

National mobility of the labour market and skilled workers is the second theme emerging from the literature that affects the adequate supply of specialised skilled workers for resource rich regions. Currently in Australia we have a two speed economy whereby those companies that are working on projects in the resources sector or supply services to this sector are in a period of sound economic growth (Daley & Lancy, 2011). However, all other industry sectors in Australia had achieved minimal or stagnant economic performance (Gregory & Sheehan, 2011). Labour mobility is supported through the use of drive-in drive-out (DIDO), fly-in fly-out (FIFO) and non-resident workers (NRWs). The supply of sufficient skilled and semi-skilled workers is topped up by using guest workers on short term temporary work visas, workers on up to 4 year 457 temporary work visas and enterprise migration agreements. There is also evidence of two and three step migration trajectories whereby migrants who entered Australia on a variety of migration pathways then progress to other visas in their pursuit of permanent residency (Hawethorne 2010).

The third thematic area within our conceptual framework is the impact on regions of the high demand for skilled workers for resource rich regions. Issues such as regional sustainability, attraction and retention, social licence and responsibility and infrastructure and services emerge (Daley & Lancy, 2011). The Royalties for Regions funding is a response by the federal government to address some of the strains on regions caught up in large resources projects (Department of Regional Development and Lands, 2011). Housing availability is a key issue for workers particularly in the north west of WA where meagre house rentals sit at \$2500 per week. The protection of agricultural land and production along with native title issues are also under threat from growing resource projects.

Training Australian workers as a response to the shortage of skilled workers is a key mechanism. Technological innovations and job design determine the types of skills workers need now and for new

jobs into the future. Critical to skilling Australian workers is clear and simple pathways from school or for mature age students to vocational education (VET) and higher education (universities). For retracting industries in Australia such as manufacturing, re-skilling these workers to move into construction, mining and energy roles could be an option and a topic for future consultation, dialogue and policy. In addition, the requirement for highly specialised workers raises the issue of profitability for training organisations in their delivery to a limited number of students. For those who have worked in industry before the pressure and quality accountability issues arise in recognising prior learning and experience. The mining sector is actively recruiting women and have run several campaigns to increase women's participation in the sector. Finally, skills recognition of overseas workers to ensure that there is parity in the work conducted on the resource projects remains an important function of statutory training assessing bodies such as TRA and VETASSESS. Trades Recognition Australia is a skills assessment service which specialises in assessments in trade occupations for the purpose of migration. Overseas Qualifications Units or their equivalents have been established in most Australian states and territories to assist migrants to obtain recognition of their overseas gained skills and qualifications.

The fifth and final theme area within our conceptual framework encompasses workforce diversity, safety and well being. Resource companies pride themselves on having robust safety culture and safety performance (Bahn & Barratt-Pugh, 2009). Central to the recruitment of workers to the sector is the management of drug and alcohol consumption and fatigue. Within the recognition of diversity in the workforce, age, gender, culture and the requirement to include 10% of Aboriginal workers is a common goal. Equity of workers is considered through employing women, the disabled and those facing multiple disadvantage in the labour market (Cameron 2009). This conceptual framework is set against a contextual backdrop of key macro trends and forces. The framework supports a future research agenda anchored by a focus on specialised skills shortages demand and supply in Australia's resource rich regions. The framework will act as a vehicle for future evidence that will inform national policy and decision making.

## CONCLUSION

Addressing the issue of skills shortages in Australia is a complex phenomenon that requires a multi-faceted approach. The resources sector requires specialised skilled labour to feed the large number of resource projects across Australia and labour from overseas is currently engaged in this work. On the other hand there is the fear that by utilising such labour Australian workers are missing out on jobs and the high wages that could be achieved if they were employed on these projects. Despite the recent calls for the end of the resources boom evidence of demand is still substantial. These issues require empirical research. Both authors of this paper have funded scoping studies due for completion at the end of 2012, investigating aspects of skilled migration in resource rich regions in Central Queensland (Gladstone) and Western Australia. These studies and additional published research undertaken by the authors are forming a growing body of work on this important and nationally significant topic. This body of work has informed the development of the conceptual framework presented in this paper and this framework underpins the future research agenda formulated by the authors. The economic imperatives underpinning this research agenda are crucial to Australia's future economic stability, sustainability and growth set against the backdrop of the European and US recession.

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## TABLES

**Table 1: Subclass 457 Visas granted 2009-2010 and 2010-2011**

<b>Top 3 Occupational groups</b>		<b>Top 3 Industries</b>	
2009-10	2010-11	2009-10	2010-11
Professionals 66%	Professionals 62.9%	Health Care and Social Assistance 18.7%	Health Care and Social Assistance 13%
Managers & Administrators 12.6%	Technicians & Trades Workers 16.5%	Information, Media & Telecommunications 10.9%	Other services 12.4%
Associate Professionals 12.2%	Managers 15%	Construction 9.6%	Construction 12.3%

Source: DIAC, 2010 and DIAC, 2011.

**Table 2: Detail of the Four CSG/LNG projects in Gladstone**

<b>Queensland Curtis LNG (QGC – a BG Group business)</b>	
Project Outline	LNG production facility to process coal seam gas – Curtis Island.
Estimated CAPEX	US\$15 billion (development program, including a 540 km pipeline network to deliver gas to Gladstone and construction of world scale LNG plant)
Timing	First cargoes expected 2014
Employment	Construction – peak 5000 (various locations) Operational – up to 1000 (various locations)
Estimated Production	8.5 mtpa initially, with approval for 12mtpa
<b>GLNG (Santos, Petronas, Total and Kogas)</b>	
Project Outline	LNG production facility to process and export coal seam gas – Curtis Island.
Estimated CAPEX	US\$16 billion (including upstream field development, liquefaction plant and associated infrastructure)
Timing	Mainland facilities and Plant construction commenced in 2011. First cargoes expected 2015
Employment	Construction – peak 5000 (various locations) Operational - 1000
Estimated Production	2 trains with combined capacity of 7.8 mtpa of LNG
<b>Australian Pacific LNG (Origin and ConocoPhillips)</b>	
Project Outline	LNG production facility to process coal seam gas – Curtis Island.
Estimated CAPEX	AUD\$14 billion Train 1 and Train 2 infrastructure
Timing	First exports expected first half 2015
Employment	LNG facility Construction - 3300 peak LNG facility Operations – approx. 175 (Trains 1 and 2)
Estimated Production	Stage 1 - 2 trains at 4.5mtpa each Stage 2 - (TBC) a further 2 trains at 4.5mtpa each
<b>Arrow LNG Plant (Shell Australia and PetroChina)</b>	
Project Outline	LNG production facility to process coal seam gas – Curtis Island.
Estimated CAPEX	TBA

Timing	Final investment decision due by the end of 2013 and first export of LNG is targeted for 2017. Stage 1 involves the construction of 2LNG trains with a further 2 trains to be constructed in Stage 2
Employment	Anticipated peak workforce of 3,715 during construction and 200 to 300 operational at LNG plant and associated facilities
Estimated Production	Plant designed for maximum capacity of 18 mtpa including the construction of Stage 1 of two trains, each with 4 mtpa capacity

Source: GEIDB (2012)

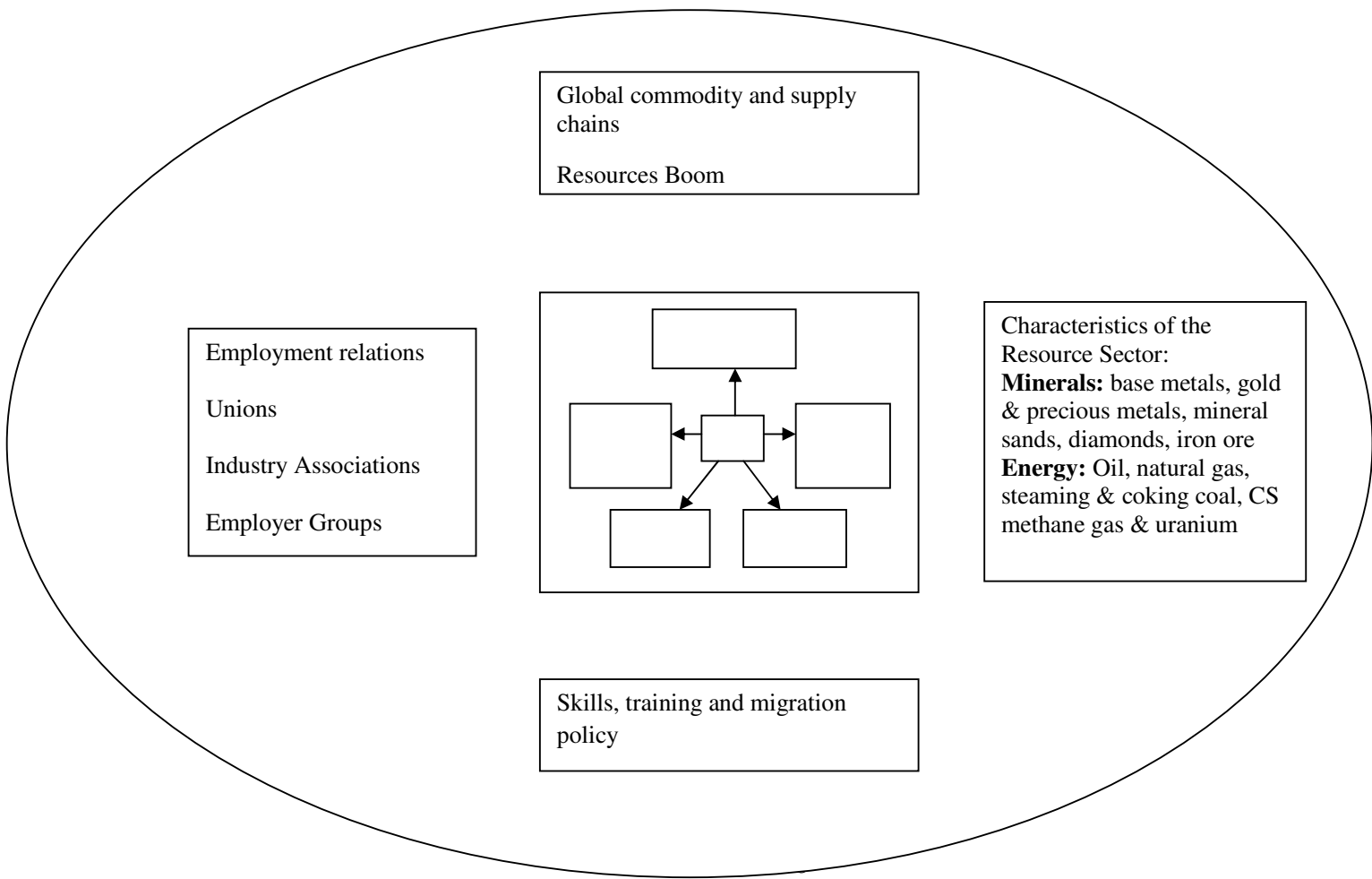
**Table 3: Qualifications in demand CSG/LNG projects in Gladstone**

<p><b>Engineering &amp; Science</b>  EngDegrees -Civil, Chemical, Mechanical, Electrical &amp; Petroleum  Environmental Science</p> <p><b>Trade (Technical) Drilling</b>  Drilling Oil and Gas Onshore (Cert II Dip)  <b>Process Plant Operators</b>  Cert III –IV Process Plant Technology  + Skill Sets</p> <p><b>Electrotechnology</b>  Cert III –Electrotechnology Maintenance (Systems &amp; Instrumentation)  Cert III –Hazardous Areas (Electrician)</p>	<p><b>Mechanical Trade (Fitting)</b>  Dip in Engineering  Cert III –Engineering, Mechanical (Maintenance, Diesel Fitting)  + Vendor training</p> <p><b>Field Construction</b>  Dip in Mechanical or Electrical/Engineering</p> <p><b>Trades (Non Technical)</b>  Cert IV –OH&amp;S  Cert III –IV Transport and Logistics  Logistics Operations  Warehousing and Storage</p>
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Source: Energy Skills Queensland (2012)

FIGURES

Figure 1: External Forces Impacting the Conceptual Framework



**Figure 2: HRM Issues in Resource Rich Regions: The Changing Nature of Work**

