Regional Development Australia - Pilbara

Regional Development Australia (RDA) is an Australian Government initiative bringing together a national network consisting of 55 committees, designed to strengthen regional communities through a partnership between Australian, State, Territory and Local Governments. RDA Pilbara is a non-profit community based organisation formed as part of the Federal Government’s RDA initiative.

This report complements the suite of documents produced by RDA Pilbara concerning different aspects of the Pilbara Region. It provides an overview of the medium and longer term challenges and opportunities for the Pilbara.

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The Pilbara is a large, dry, thinly populated region in the north of Western Australia known for its Aboriginal peoples, its stunning landscapes, the red earth and its vast mineral deposits. It is a bioregion under the Interim Biogeographic Regionalisation for Australia.

The Pilbara is remote – from major centres, from markets, from labour sources. Its environment is harsh, with many days above 40°C. It is subject to cyclones. There is not much water.

It is also one of the most productive and dynamic regions in Australia.
The Pilbara is a resources region – one of the strongest in the world.

The area is branded by its petroleum, natural gas and iron ore deposits, which contribute significantly to Australia’s economy. Other industries are pastoral activities, fishing and tourism. The Pilbara encompasses iron ore ranges, tin, manganese and gold deposits, coastal solar salt fields and the North West Shelf oil and gas fields. It is primarily known for the iron ore and petroleum products and is responsible for over 96% and 97% respectively of Western Australia’s exports of these commodities.

Major economic activities in the Pilbara include mining of iron ore and base metals, and the extraction of oil, gas and salt. There is a small manufacturing and minerals processing industry and service industry as well as tourism, pastoralism and fishing activities. The largest export commodity in Australia is iron ore and approximately 95% of this is produced in the Pilbara. Demand for iron ore principally comes from Japan, China and other rapidly developing Asian nations. The region also produces 70% of Australia’s natural gas. This is sourced from the Carnarvon Basin off-shore and is serviced and processed onshore from the Shire of Roebourne at Dampier.

The Pilbara accounts for almost two thirds of the commodity exports of the State by value, which is almost 20% of the total value of merchandise exports of Australia. This means that 20% of national goods exports is made possible by 0.2% of the national population.

The value of the WA minerals and energy sector has grown substantially. The drivers of the growth have particularly been in the iron ore, LNG and gold sectors. In 2012 the Pilbara (on and off shore) was responsible for $75.1 billion of the production value of minerals and petroleum, 74% of the Western Australian total. This is projected to grow strongly as construction projects currently underway are completed and production increases. The projected total value of earnings of minerals and petroleum to be produced in the Pilbara by 2018 is approximately $211 billion.

The value of earnings from the Pilbara can be compared to the Gross Domestic Product (GDP) of many nations. As a comparison, the $211 billion earnings projected for 2018 represents:

• 17% of Australia’s total GDP;
• 150% of New Zealand’s GDP; and,
• Greater than the individual GDP of 117 of the world’s 184 nations.
The Pilbara’s economy is diverse:

• In 2012 approximately 455 million tonnes of iron ore was exported from the Pilbara, at a value of $48.6 billion, around 40% of world production.

• The Pilbara services the offshore Carnarvon Basin, Australia’s largest known oil and gas reserve that earned $24.4 billion in 2012 (21% of Western Australia’s total minerals and petroleum value) or 97% of Western Australia’s petroleum production (crude oil and condensate, LNG, natural gas and LPG) in 2012. Up until recently, all LNG from Western Australia originated from the Northwest Shelf Venture’s (NWSV) project at Karratha. In 2010-11, LNG reported output from the NWSV increased by almost 8% to 17 million tonnes and the value of sales rose by 25% to $8.7 billion. Australia’s biggest resource initiative, the Gorgon Joint Venture LNG project is being developed at an estimated cost of $43 billion. A further $26.2 billion of offshore committed projects are planned for in the near future.

• The Pilbara has the second largest gold mine in Australia and copper and manganese are already being mined. Deposits of nickel and uranium may be developed in the future. It has the second largest solar salt fields in the world behind China (with large commercial ventures operating out of Onslow, Dampier and Port Hedland). The region produced other minerals (gold and silver, copper, manganese, salt, construction materials, tantalite, tin and gems) to a value of $2.2 billion in 2012.

• The Pilbara produced roughly 15% of the value of the State’s pearl production at $13.5 million in 2008-09. In addition, aquarium species of fish were valued at $88,600. The live weight fishing catch for the Pilbara Region in 2008-09 was 2,264 tonnes valued at $9.5 million, a 2% increase from the previous year. The live weight catch for finfish in 2008-09 was 1,909 tonnes valued at an estimated $8 million, 23% of Western Australia’s total finfish catch.

There is ongoing mine, port and other heavy infrastructure expansion and long-term contracts, and the forecast is for continued growth in resource exports from the Pilbara for the foreseeable future.

Its location to the north of Western Australia and in the same time zone as many of the highest growth countries in the world provides some interesting opportunities. However, without investment in critical community infrastructure and services, that enhance liveability, the capacity of the Region to continue to respond to this demand will be compromised and productivity will decline.

By 2050 six of the ten most populous countries in the world will be India, China, Indonesia, Pakistan, Bangladesh and the Philippines. As shown in the graph below.

Most populous countries, ($b)

Source: UN, The Economist

1 Department of Mines and Petroleum, Mineral and Petroleum Statistics Digest 2012
After an initial period of establishment of the resources industry in the 1960s, the region’s population grew from a few thousand residents to 40,000 by 1981. It then had a long period of almost no growth until around 2003, when rapid expansion of the resources sector re-commenced. Between 2006 and 2011 the resident population grew from 44,000 to 62,700, an average annual growth rate of 7.3%, and the service population, including Fly-in Fly-out (FIFO) workers, grew from 45,000 to 73,000 in 2011.

The Pilbara contains half of the minerals and energy workforce in WA. There is still substantial new project activity in the Region. This is represented by high construction activity and a high construction workforce. However, this will slow towards the end of the decade, with a forecast reduction in the minerals and energy workforce.

The Nation’s Powerhouse

The Pilbara’s growth has been stellar.
This reduction will be accompanied by a substantial change in the composition of the workforce. The minerals and energy workforce in the Pilbara will undergo a significant shift from construction to operations till 2018. Planned projects suggest 22,900 fewer construction workers will be required in 2018, whereas 13,600 additional operations workers will be required. The net effect of these changes is a 14% decline in the minerals and energy workforce in the Pilbara by 2018, with 9,300 fewer minerals and energy workers.

The construction workforce is largely FIFO, while the operational workforce is more likely to be residential on-site. The result of the changes is likely to be a substantial reduction in FIFO numbers and a small increase in minerals and energy resident workforce.

There are new prospects that may arise and become viable over time and be either located in or serviced from the Pilbara and these would re-ignite the construction sector. These include Canning Basin gas projects and the Balmoral South and Balla Balla magnetite projects.

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There are, however, several threats facing Australia’s LNG market. High project costs, scarce labour supply, a strengthened Australian dollar, infrastructure bottlenecks and tight environmental regulations could combine to delay the timing of some LNG projects coming on stream.

The graph below illustrates various LNG facilities globally based on their output and investment value. This data indicates that new Australian LNG facilities have a relatively high capital costs basis when compared to projects in other countries. The Sabine Pass project in Texas is the first export-capable LNG facility to be constructed in the US and available data indicates that its capital costs are substantially lower than most Australian projects. This gives the prospect of US-sourced LNG competing directly with Australian product and puts a cloud over new LNG projects in Australia in the short and medium term.

Nevertheless there is substantial activity in the Australian LNG projects and iron ore projects under construction already. Most have long term contracts attached to them. The proximity, low political risk and available resources will enable Australia to maintain a key role in supplying the Asian market.

By 2018, global LNG trade is expected to be heavily dominated by Qatar and Australia, with a combined total of approximately 50% of the global market. This outcome would generate a very substantial pricing power for these two countries.

The base economic activity for the region is strong. The economy of the Pilbara, particularly the contribution from the resources sector, is the major driver of growth in the region. The Pilbara has impacts on the economic progress of the State, and in turn, is impacted by developments in the State and Australia, including policy settings and competition for inputs needed for large-scale expansion and diversification.

Expansion projects in advanced planning include infrastructure that will strengthen the capacity of the region. These include the Anketell Port project and the Lumsden Point Maritime Common User Facility. The latter, in particular, will provide infrastructure to service the oil and gas, resources, defence, housing and construction industries. It could provide the capability for the region to play a significant role in newer on-shore and off-shore gas and other resources projects.
However, the evidence is that there is no guarantee the current high-growth trajectory will continue after the current round of major construction projects are completed, and that the region will move quickly towards a much lower growth, but busy operational phase.

The question then is what will drive the transition of the region to a potential next phase – one which meets the aspirations of longevity and sustainability – one of resilience.

The world-class iron ore and LNG operations on which the region’s wealth is based are highly capital intensive but have a high demand for skilled labour. This and the remote nature of the region have led to a very high cost base for businesses and for residents.

The heavy reliance of the Pilbara on minerals and energy industries carries many areas of vulnerability:

- Technology changes: major companies with capital intensive operations will seek to continually reduce on-site labour costs – remote mining technology is one of the main areas of research for the mining majors. This technology is under development and is being steadily implemented by the major resource companies. This will serve to dampen regional population growth generally.
- The vagaries of commodity prices: this is moderated by the long term nature of the major projects, but will influence the viability of new projects.
- Changes in the project lifecycle: for example the imminent and widespread major shift from development to production.
- Competing supply for both gas and ore products from other global locations, often with a lower cost base.

The constraints to growth and diversification in the Pilbara are formidable. It is unlikely that economic and social opportunities in the region will be fully maximised without changes to the operating environment. The region needs much more than resources for its future. There are many challenges:

- An unbalanced economic structure, with resources completely dominating Gross Regional Product (GRP), with exposure to commodity price fluctuations and rising costs;
- The small size of the local market and the current exceptionally high cost structure of the region;
- Shortages of land and accommodation restraining commercial growth; and,
- Existing essential infrastructure installations are at, or beyond, capacity and there are high costs associated with new power, water and transport supply capacity.

Beyond Resources

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- Existing essential infrastructure installations are at, or beyond, capacity and there are high costs associated with new power, water and transport supply capacity.
The Region’s costs are a particular challenge:

- The price indexes for the Pilbara are the highest of any region in WA and impact negatively on employment costs to businesses and NGOs. Over the five year period from 2007 to 2011 the gap between the Regional Price Index for the region and Perth had widened by 26 points which equates to an average increase in costs of nearly 5% per year when comparing the two regions.\(^5\)
- The major cost drivers in the Pilbara are the resource sector, growth in demand outstripping supply, and constraints to economic development and infrastructure provision.
- In 2012 the data show that in the Pilbara the level of remuneration for employees would need to be a minimum of 37% higher than that in Perth, and that there is often a need to provide subsidised or free accommodation to attract or retain employees.
- Although costs will rise more slowly in the next few years (and may fall slightly for some items) the absolute level of costs will remain one of the highest in Australia overall. (This is not uncommon in resource provinces worldwide).
- The cost to households and businesses of utilities is anticipated to continue to rise in the Pilbara and the high socio-economic costs to communities and businesses is creating numerous distortions to “normal” market price signals.
- A comparison of the cost of main items of operating a business shows the costs in Pilbara towns is up to 120% higher than in Perth. Faced with such substantial costs and with a small market size, some businesses are struggling to survive, while NGOs continually deal with considerable programme funding challenges. Businesses and NGOs face high costs for several other important cost items, such as staff training, staff recruitment and turnover, travel, professional services and consumables.
- Businesses sometimes have to purchase or rent accommodation for staff, adding an extremely high cost for business start-ups.
- Construction costs for houses or offices can be as much as twice the Perth norm for a similar building.
- The cost of doing business in the Pilbara for SMEs and NGOs has risen primarily as a result of the high demand for labour, accommodation and other services by the resources sector. Clearly it is in the best interests of all businesses, small or large that such costs are reduced.
- FIFO activity is unlikely to substantially transform into more permanent residency until costs in the Pilbara “normalise” and the range of services/facilities improves.

This directly affects the NGO Sector. NGOs have a vital role to play in the region in providing a range of much needed services:

- Escalating costs faced by NGOs in the Pilbara are not taken into account in providing adequate and secure funding.
- Numerous NGOs based in Perth have very little on the ground presence in the Pilbara due to the affordability and staffing challenges of the region.
- NGOs have difficulties in attracting and retaining staff unless they make significant contributions to their accommodation costs.\(^6\)

It also restricts the establishment and operations of small and medium size (SME) enterprises:

- In the SME sector it is necessary for businesses to pay relatively high costs for labour, accommodation and other items in order to secure and retain staff;
- Diversification opportunities are limited by the cost structure, which also acts as a barrier to entry for new enterprises;
- The impact of the high cost structure in the Pilbara is reflected in the fact that in 2010/11 the region had 2,343 active businesses and 255 businesses per $1 billion of GRP, which is the lowest in WA by a substantial margin; and
- In numerous service sectors there is little or no representation in the Pilbara, requiring such services (and products) to be imported from outside of the region, usually Perth.

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\(^5\) Based on ROL CPI reports for 2007 and 2011
There is a need to concentrate on features which will make the Pilbara attractive – beyond resources. A resilient future builds on the strong resource base, but does not rely on it to meet all future needs.

The urgent needs are therefore:

- A diversified economy – more economic resilience; and
- Services and life-style features to support a large and more diverse population.

The region is competing globally. It must attend to the factors which have been identified to make places attractive for people to live. These have been identified several times for cities and can be applied, with modifications, to regions. For example, the Economist Intelligence Unit (EIU) identifies eight factors based on an international survey.

Others have summed it up in similar fashion. PricewaterhouseCoopers identify the key factors for Cities of Opportunity:

- Intellectual capital and innovation
- Technology readiness
- Transportation and infrastructure
- Health, safety and security
- Economic clout
- Ease of doing business
- Demographics and liveability
- Lifestyle assets

The common thread is not only economic opportunity – the environment for new businesses to flourish and compete nationally and internationally and for employment which is well compensated – but also, and crucially, social and cultural attractions – the opportunity for a safe, productive and happy life. While career factors are a major motivator in ensuring a region is an attractive place in which to live, safety, culture, education and public infrastructure play a crucial and ultimately defining role.

The ability to attract and retain a residential workforce in regional WA depends in part on the cost of living and amenity in key regional centres. The selection of a workforce model (residential vs. fly-in, fly-out) depends in part on the preferences of workers and the costs of housing a residential workforce. A mismatch between demand and supply of land has resulted in Pilbara property prices and rents increasing significantly, increasing the probability of both companies and individuals making the FIFO choice. It is only in the very recent period that accommodation supply in the major centres has started to catch up with demand and accommodation prices are starting to moderate.

Accumulated research and experience of regional development identifies common factors that influence individual decisions to live in or leave a community:

- Economic opportunity and employment prospects, not only for the primary breadwinner but for all members of the family, including partners and children;
- Education services: a common time of relocation is when children reach critical stages in their education, particularly at key stages of secondary school and when first entering tertiary education;
- Health services, particularly access to a reasonable range of specialist services; and
- Access to a reasonable range of cultural and recreation activities.

The more that a regional community can supply these, the more resilient and stable the community.
How does this apply to the Pilbara? It is a location on the world stage and in a competitive environment for funds, resources and people. The key factors are partly economic, but also social, community and cultural. The region is competing for highly skilled minerals and energy workers. At the top level these workers are able to choose from a wide range of international resource hubs.

It also has a need for significant economic diversification. This also requires highly-skilled and committed people. The attractiveness of the region as a place in which to live and work is a key determinant of the region’s ability to grow.

However, growth is not inevitable:

- The Chamber of Minerals and Energy report shows some continuing construction activity (except in the Shire of Roebourne) but low growth in the operational workforce. It would need a continuing stream of new projects to maintain the past minerals and energy growth momentum.
- There are risks to commodity prices (both iron ore and LNG).
- Over the very long term the resources have a lifespan – the community must plan to outlive this lifespan.

This implies the need for resilience, with a much diversified economy: increased resilience leading to liveability leading to longevity. The alternative is low growth and even a long term decline as the resources cycle changes.

A key new factor in the next stage of growth for the Pilbara is a change from the past impetus for growth. To date, development momentum has been driven by the needs of big organisations driving big projects, supported by big government intervention. This phase is coming to an end: the next phase will consist of a much richer mix of much smaller and diversified projects and initiatives and will need to arise from within the community not be imposed from outside as much as it might have in the past.
Pilbara Cities Vision

The Western Australian government’s Pilbara Cities vision is to create attractive, sustainable local communities and places where people choose to settle on a permanent basis, to bring up families with access to high standards of education, health and diverse employment and career opportunities. The Pilbara Cities key focus areas are infrastructure coordination; land availability and development; community projects and engagement; and economic diversification. The purpose of focusing on these areas is to address the challenges associated with record population growth resulting from exponential growth within the resource sector.

The graph to the left shows the Pilbara Cities population outcome and the ‘business as usual’ outcome if no intentional actions are undertaken.

A well-resourced, high functioning NGO sector providing a broad range of services and programmes to Pilbara communities will play a critical role in underpinning the immediate and ongoing success of the Pilbara Cities vision.

The Pilbara Cities vision accommodates a high population growth. This population both requires and will support an expanded range of services and programmes to Pilbara communities and implies that the current requirement for improved liveability and affordable accommodation are met.

The elements required to achieve the Pilbara Cities vision are well known and are consistent with the cities comparative analysis of the EIU and others. It means the Pilbara must contain a rich mix of elements to support its population in happiness and prosperity:

- Education services at a high level to keep people in place longer:
  - Better quality secondary school education;
  - More diversity, including private secondary schools;
  - Much upgraded tertiary education and development of research specialities. These might include:
    - Remote communities;
    - Mining technology;
    - Environmental sciences; and
    - Indigenous Health.
- Health and welfare services meet the health needs of all the community and the training skills development to achieve this.
- A richer cultural life, with cultural activities more than pubs and movie downloads.
- Well supported and vibrant community groups.
- A wide range of formal and informal sporting and recreation opportunities.
- Places for people to meet – this means paying attention to the liveability of the major centres (This is where the population expansion will occur):
  - Karratha town centre programme;
  - Port Hedland; and
  - Newman.
- Attending to cost issues – lowering the cost base for accommodation and key services.

There are clear challenges. However the results will be worthwhile, giving true sustainability to the region’s community, with increased resilience.

It is important for the national economy that this be achieved: the outcome of the programme will be greater international competitiveness, for both existing and new projects, and a greater contribution to the national economy.

The achievement will not be without cost and effort, with programmes and investment across a wide spectrum:

- Infrastructure:
  - Land and housing;
  - Power and water supply;
  - Waste water management;
  - Waste management;
  - Airports (including international capability);
  - Ports; and
  - Roads.
- Economic diversification projects.
- NGO gaps.
- Cultural programmes.
- Community building programmes.

The growth of the community sector is a particular challenge. Investments are needed in the key areas of health; education; social services; cultural tourism and economic development; sport and recreation, and the (natural) environment. Specific investments include the new Nickol Bay hospital and $65 million Karratha Leisure Complex (KLC), while more broadly it is noted that there is a need for improved Information Communications Technology (ICT) and greater provision of social services. Investment in tourism infrastructure is essential for the Pilbara, focusing on attractions such as Aboriginal art and culture and the unique natural landscapes and features of the region. In tandem with this, is the need for conservation strategies and a natural resource management programme, in order to address localised issues and preserve the natural environment.

The four Pilbara LGAs have a range of strategic and community plans and policies recognising and supporting environmental and sustainability considerations, activities and initiatives. Importantly, underpinning development in all community sectors is the need for affordable housing, as this has an impact on attracting and retaining workers, accommodating tourists and encouraging permanent residency in the region.
To get a better idea of how to achieve the Pilbara Cities vision, an investigation of the competitive position of the Pilbara is instructive.

A range of factors largely explain differences in regions’ economic prosperity and growth patterns. These include differences in resource endowments, the size of markets, demography and population dispersion, levels of human capital, the extent and incidence of taxation and the level and quality of public expenditure, as well as competition and market settings. It is therefore useful to investigate prospects for the region through the prism of its economic performance and competitiveness relative to other regions or wider areas.

A competitiveness index developed by the Regional Australia Institute, and drawing on the World Economic Forum’s Global Competitiveness Report, provides some guidance. The ten themes of regional competitiveness are distinguished between:

- Those that are essentially fixed in nature and, cannot easily be adjusted (such as the presence of natural resources or market size); and,

- Those that can be changed by policy decisions, either directly through a decision to build, invest or change (such as institutions and infrastructure), or at least influenced by policy (such as human capital and labour market efficiency).

An assessment of the Pilbara on these parameters provides an indication of the areas of comparative strength in the region and those that need attention or strategies to deal with them.

In the following section graphs for selected parameters show the relative comparative rankings for the Pilbara Region against all 55 Australian Regions identified by Regional Development Australia and using the data measures utilised in the Insight project. Note that this includes regions within capital cities. The graphs show relative distance from the median rank; 1 represents the highest ranking and -1 the lowest ranking amongst the regions.

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1. Institutions:

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<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
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<tbody>
<tr>
<td>Regional government influence at state and national level</td>
<td>The Pilbara is a high profile regional location and has very good exposure at the state government level and, to a lesser extent, nationally.</td>
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<tr>
<td>Clear roles and responsibilities in regional governance</td>
<td>At the development level there is quite a lot of crossover between individual local governments and state agencies and at development policy level there is some duplication across all three tiers of government.</td>
</tr>
<tr>
<td>Financial burden of local government</td>
<td>The local governments have very high financial commitments for the provision of infrastructure and services for a rapidly expanding population, with a limited rate base and are under constant financial pressure.</td>
</tr>
<tr>
<td>The local and regional assistance available for businesses</td>
<td>The local and regional bodies have limited funds available for direct business assistance, but it ranks amongst the highest among Australian regions.</td>
</tr>
<tr>
<td>Regional government independence (Councils with more autonomy are more able to respond to local needs/demands)</td>
<td>Compared with some other Australian jurisdictions, there is a high reliance on government decisions made outside of the region, particularly at State government level.</td>
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Overall: In comparative terms the Pilbara is in a strong institutional position: its influence at state and national level is comparatively high and regional governance is relatively transparent with reasonable clarity of roles. However, regional autonomy is quite low: local capabilities are highly dependent on continuing influence and good relations with the state government (in particular) and national government for resources; there is limited ability to raise funds locally for expansion projects. The relatively low proportion of people working in the public sector has positive and negative aspects to it: there is reduced understanding amongst the various levels of the bureaucracy of regional conditions, but a higher reliance on private sector activity to drive the economy and NGOs to drive partnership and deliver gaps in community services.
2. Infrastructure and Services

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<tr>
<td>Road infrastructure</td>
<td>The region contains part of the intrastate regional road network - given the relative remoteness of the Pilbara it is a high quality connection.</td>
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<tr>
<td>Aviation infrastructure</td>
<td>The region has several large airports, including two that have regular interstate connections and are capable of expansion to regular international operations.</td>
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<td>Access to higher education</td>
<td>There is only limited access to higher education – the Pilbara Institute provides a range of vocational education and training courses, but there is virtually no access to tertiary education.</td>
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<tr>
<td>Port infrastructure</td>
<td>The region contains some of the largest and busiest bulk ports anywhere. It has limited capacity for general cargo. A common user facility is planned but not yet executed. This would enable servicing of new projects outside of the region, either off-shore or in the Canning Basin.</td>
</tr>
<tr>
<td>Land cost</td>
<td>Land cost generally is very high for all classes of accommodation. The median cost of buying a house in December 2012 was $747,000 in Karratha; $844,000 in Port Hedland; $840,000 in Newman and $890,000 in Onslow. It was $495,000 in Perth.</td>
</tr>
<tr>
<td>Access to hospital services and to allied health services</td>
<td>With the establishment of the Nickol Bay Hospital in Karratha and the South Hedland Health Campus, there are good quality district and regional hospitals, but limited specialist services. There is evidence that people need to leave the region for long periods for specialist treatment. There is limited aged care available.</td>
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Overall: The region has good transport connections and infrastructure. However it ranks poorly in all aspects of access to health services and education services. These are critical areas if the population is to be retained and expanded. Extended GP, specialist and aged services are required to service population growth and to meet Pilbara Cities objectives. There is a critical need for vastly expanded access to tertiary education and also technical and further education and training.
3. Macroeconomic Conditions

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<tr>
<td>Population churn</td>
<td>The population turnover is high. This makes it difficult to develop a large and consistent group of regional ‘champions’.</td>
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<tr>
<td>Stability of the local economy (local inflation)</td>
<td>Local inflation is high – local costs generally are high compared with elsewhere in the country.</td>
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<tr>
<td>Building approvals – value of new investment</td>
<td>The rate of building approvals is generally high, showing good evidence of business willingness to invest in the local community.</td>
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<tr>
<td>Total income per person</td>
<td>The average income is much higher than the national average, with a very high proportion of individual workers earning very high incomes.</td>
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Overall: Average incomes are high, meaning there is wealth in the community and latent demand for new business initiatives; however the cost base is very high.

4. Human Capital

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<tr>
<td>Median age of the workforce</td>
<td>Generally the workforce is younger than the national average, with a high proportion in the 25 to 44 year age groups.</td>
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<tr>
<td>Workforce education levels</td>
<td>The region has a lower proportion of people with tertiary education in the workforce, even compared with other resources regions in Australia.</td>
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Relative Strengths: Human Capital

Overall: The region has a relatively young, healthy and energetic workforce. However, the region ranks comparatively poorly on other measures of human capital, with a lower than average incidence of trade qualifications and of tertiary education amongst the workforce. The high proportion of FIFO workers limits the ability of this part of the workforce to contribute to regional expansion beyond the specific project on which they are working. Of particular note is the relatively low school performance scores at both primary and secondary level. This is a key factor that must be improved if population retention and growth is to be achieved.
5. Labour Market Efficiency

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<tr>
<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage/labour costs</td>
<td>Very high.</td>
</tr>
<tr>
<td>Unemployment rates in the region</td>
<td>Generally low.</td>
</tr>
<tr>
<td>Levels of labour force participation in each region</td>
<td>Generally high.</td>
</tr>
<tr>
<td>Youth unemployment</td>
<td>Generally low.</td>
</tr>
<tr>
<td>Skilled labour</td>
<td>Generally very low.</td>
</tr>
<tr>
<td>Welfare dependence</td>
<td>Generally low (except for indigenous community).</td>
</tr>
</tbody>
</table>

Overall: In comparative terms the labour force is relatively engaged, flexible and mobile. However, the participation rate is quite low, possibly partly reflecting the indigenous population, but also possibly reflecting the lower than average participation of partners of people working in major projects who might regard their time in the Pilbara as relatively short term and not have employment that meets their needs or expectations coupled with high cost of child care. The level of skilled labour (i.e. people employed as managers and professionals) is amongst the lowest in the country.
6. Technological Readiness – Regional business and individual effectiveness using information and communication technologies (ICT); Preparedness for technological development

<table>
<thead>
<tr>
<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government IT investment</td>
<td>Karratha and Port Hedland are served by the Telstra fibre optic trunk cable.</td>
</tr>
<tr>
<td>High-speed broadband availability</td>
<td>Large parts of the major centres already have NBN commenced or are on the three-year rollout programme but not more remote areas.</td>
</tr>
<tr>
<td>Mobile phone coverage</td>
<td>Adequate in the major centres.</td>
</tr>
<tr>
<td>Businesses in technology related industries</td>
<td>Average for a regional centre.</td>
</tr>
</tbody>
</table>

**Relative Strengths: Technological Readiness**

- Broadband connections: % of households and businesses with broadband internet
- Workers in ICT and electronics: % employed as ICT and electronics specialists
- Internet connection: % of households with internet connection
- Businesses in technology and related industries: % of workforce employed by technology related businesses

Overall: There is coming to be good access to high speed broadband in most parts of the region and particularly in the main settlements. This is not a barrier to growth. There is no particular expertise amongst the business community for technology related industries.
### 7. Business Sophistication

<table>
<thead>
<tr>
<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of region's overall business networks</td>
<td>Small business networks and local chambers of commerce exist and can be expanded.</td>
</tr>
<tr>
<td>Dominance of large employers - number of large firms in the region</td>
<td>Economy is dominated by a very small number of very large employers.</td>
</tr>
<tr>
<td>Exports</td>
<td>High proportion of imports in all sectors (except for mining), particularly services.</td>
</tr>
<tr>
<td>Economic diversification</td>
<td>Low.</td>
</tr>
<tr>
<td>Access to local finance</td>
<td>All channelled through Perth and elsewhere.</td>
</tr>
<tr>
<td>Income source – own business</td>
<td>Relatively small SME sector.</td>
</tr>
</tbody>
</table>

#### Relative Strengths: Business Sophistication

- Exports: % business sales revenue earned from exports
- Income source - Own business
- Economic diversification
- Access to local finance: Number of banks/lending institutions as a share of total businesses
- Exporters, importers, wholesalers: % employed
- Dominance of large employers

Overall: The region is dominated by very large employers and has a small and underdeveloped small and medium business sector. With several exceptions there is not a tradition of new enterprise creation.
### 8. Innovation

<table>
<thead>
<tr>
<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources in science and technology</td>
<td>Comparatively low.</td>
</tr>
<tr>
<td>Presence of research organisations</td>
<td>Very low.</td>
</tr>
<tr>
<td>Patents</td>
<td>Very low.</td>
</tr>
<tr>
<td>Expenditure on research and development</td>
<td>Very low, except for within major companies as part of their operations research; this explains the high overall ranking.</td>
</tr>
</tbody>
</table>

**Relative Strengths: Innovation**

- **Expenditure on research and development:** Average expenditure on R&D per business
- **Presence of research organisations:** % of research organisations out of all businesses
- **Human resources in science and technology**
- **Research and development managers:** % employed

Overall: Amongst the major minerals and resources companies the level of leading edge research and development is very high and its application in the region is widespread, resulting in continuous innovation and globally competitive operations. This presents an opportunity for the future of the region. It provides a level of skill and expertise that can be applied to other regional enterprises and also opportunity for supply chain and spin-off enterprises.
9. Economic Fundamentals

<table>
<thead>
<tr>
<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of local market</td>
<td>There is a substantial and growing population base, although it is relatively small compared with most other Australian regions. A key strategic advantage is the presence of very large purchasers in the form of the major mining companies – local businesses able to supply to them will develop skills and expertise in selling to world-class purchasers, which will increase their viability for expansion outside of the region, including international expansion.</td>
</tr>
<tr>
<td>Number of businesses relative to population size</td>
<td>There is a relatively small business sector - this reflects the presence of very large employers and the high cost base.</td>
</tr>
<tr>
<td>Proximity to markets</td>
<td>Main metropolitan markets are distant and will have high freight costs to service them. This will affect the viability of some potential agri-business diversification projects.</td>
</tr>
</tbody>
</table>

Relative Strengths: Economic Fundamentals / Market Size

Overall: While the region currently has a relatively small local market, it is coming to a scale that it can support a greater range and diversity of business and services; the presence of world-class purchasers provides a substantial opportunity.
## 10. Natural Resources

<table>
<thead>
<tr>
<th>Competitiveness Index Element</th>
<th>Pilbara Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional access to natural resources</td>
<td>There are abundant mineral resources but very limited water resources.</td>
</tr>
<tr>
<td>Physical attributes of a region, and whether they are conducive to industry</td>
<td>The climate is not conducive to agriculture, except for some potential specialist and technology-intensive applications. There is CO₂ feed stock and good conditions for intensive algae farming. There are high-value heritage sites, giving tourist potential.</td>
</tr>
</tbody>
</table>

**Overall:**

There is opportunity for several main classes of expansion to the externally-oriented sectors of the Pilbara economy:

- **Expansion of the economic base** – the probability of development of the main minerals and energy projects has been addressed and analysed in the Chamber of Minerals and Energy report. This shows some expansion, but a general slowing of new construction and a fairly quick transition to an operational phase overall. However, there are new prospects that may arise and become viable over time and be either located in or serviced from the Pilbara. These include Canning Basin gas projects and the Balmoral South magnetite project.

- **Diversification projects:** several of these are possible and are addressed below.

- **Exportable services:** at the moment the services base of the Pilbara is small and underdeveloped. However, research institutes and tertiary education focussing on further development of the region’s base minerals and energy industries and spin-offs from technology-based diversification projects would provide a services sector with output applicable outside of the region. This is an area of great opportunity for the region and is one key to achievement of the Pilbara Cities vision.
International Comparisons

The Pilbara is amongst the largest resource province in the world. With significant deposits of both minerals and oil and gas reserves, it also has a level of diversity that sets it apart. It has many features that are unique to it, but also some similarities with others.

Direct comparisons with other resource areas globally are almost impossible to make convincingly: there are many variations of resource features, culture and social, economic and political systems. However, by examining a selection of other locations in advanced western economies\(^\text{10}\) which have local economies dominated by resource industries, it is possible to get some international perspective on development in the Pilbara and some flavour of longer term opportunities.

The selected regions are:
- Athabasca oil sands area, Alberta, Canada
- Antofagasta Region, Chile\(^\text{11}\)
- Stavanger, Norway
- Aberdeen, Scotland

Some detail of each region is discussed below.

The Athabasca oil sands area of Alberta, Canada, has many similarities to the Pilbara:
- It is relatively recently developed: until the 1960s, when the oil sands industry commenced, it was very sparsely populated. It is now growing rapidly. However, its growth is dependent on one resource only, namely tar sands oil extraction.
- It is subject to extreme climatic conditions (extremely cold winters, as against extremely hot summers in the case of the Pilbara).
- At around 80,000, it has a similar population to the Pilbara although most of the population is focussed on one town (not two or more as in the Pilbara), the main centre of Fort McMurray, with a population of around 62,000. The town has some tertiary education and an active cultural and artistic community. There is a high transient worker population.
- Regional decision-making is centred in the Provincial capital, Edmonton. There is no equivalent programme to the growth and diversification programme incorporated in the Pilbara Cities strategy.
- As in the Pilbara, there is a programme of engagement and employment for indigenous (First Nation) people, with active programmes by major resources companies.

The Antofagasta region of Chile is the heart of Chile’s mining industry, the country’s main source of export revenue. It represents 53% of Chile’s mining output, led by copper and followed by potassium nitrate, gold, iodine, and lithium. The mining industry accounts for 93.7% of the region’s exports. It is located in the Atacama Desert, one of the most arid regions in the world. There has been substantial mining activity in the region since the 19th century and the region now has a substantial population, around 500,000, and the main town, Antofagasta, contains around 70% of that and is growing briskly. The town is the regional capital, a second-level administrative region in the country and this gives substantial regional autonomy. There is a good level of economic diversification, with, for example, substantial business tourism and trade fair events based on mining activities and a military presence, including a training academy.

\(^{10}\) The proxy for this is OECD membership
\(^{11}\) Chile became the first South American OECD country in 2010
The Stavanger region is Norway’s third largest conurbation with a population of about 400,000 inhabitants. The city of Stavanger itself has a population of 118,000. Located on the Stavanger Peninsula in Southwest Norway, Stavanger counts its official founding year as 1125, the year Stavanger cathedral was completed. The city’s rapid population growth in the late 1900s was primarily a result of Norway’s booming offshore oil industry. Today the oil industry is a key industry in the Stavanger region and the city is widely referred to as the Oil Capital of Norway. The largest company in the Nordic region, Norwegian energy company, Statoil, is headquartered in Stavanger. Multiple educational institutions for higher education are located in Stavanger. The largest of these is the University of Stavanger, which offers doctorates in Petroleum Technology and Offshore Technology among others. Domestic and international military installations are located in Stavanger; among these is NATO’s Joint Warfare Centre. Other international establishments, and especially local branches of foreign oil and gas companies, contribute further to a significant foreign population in the city. The Stavanger region, together with Liverpool in the UK, was selected as a European Capital of Culture for 2008. The Stavanger 2008 vision is expressed in the concept “Open Port”. This can be understood both in its English sense - an open harbour, and in its Norwegian meaning - an open gate. Open Port represents Stavanger’s openness to the world. The region and its people are regarded as being especially open and inclusive towards arts, new ideas and opportunities. The region also has a substantial tourist economy, hosting around 130 cruise ships annually.

Aberdeen is one of the most prosperous cities in Scotland owing to the variety and importance of its chief industries. The petroleum industry in Aberdeen began with the discovery of significant oil deposits in the North Sea during the mid-20th Century. Aberdeen became the centre of Europe’s petroleum industry. With the largest heliport in the world and an important service ship harbour port serving oil rigs off-shore Aberdeen is often called the Oil Capital of Europe. The number of jobs created by the energy industry in and around Aberdeen has been estimated at half a million. Aberdeen is Scotland’s third most populous city, with an official population estimate of 220,000.

Today oil reserves are still flowing but it has been estimated that the North Sea is nearing or has even surpassed its peak production rate. Consequently, the city is in the process of redeveloping itself as a research and development hub, as well as a base for off-shore drilling, to keep the multi-national companies that drive the economy. Many Aberdeen companies now provide support for overseas oil and gas industry.

Until the 1970s, most of Aberdeen’s leading industries dated from the 18th century; mainly these were textiles, foundry work, shipbuilding and paper-making. These industries have been largely replaced. High technology developments in the electronics design and development industry, research in agriculture and fishing and the oil industry are now major parts of Aberdeen’s economy. Aberdeen is now well regarded for the agricultural and soil research as are the city’s two universities. The Rowett Research Institute is a world-renowned research centre for studies into food and nutrition located in Aberdeen. It has produced three Nobel laureates and there is a high concentration of life scientists working in the city.

It is an attractive place: Aberdeen has won the Britain in Bloom competition a record-breaking ten times, and hosts the Aberdeen International Youth Festival, a major international event which attracts up to 1,000 of the most talented young performing arts companies. In 2012 Mercer named Aberdeen the 56th most liveable city in the World, as well as the fourth most liveable city in Britain. In 2012 HSBC named Aberdeen as a leading business hub and one of eight ‘super cities’ spearheading the UK’s economy, marking it as the only city in Scotland to receive this accolade.

As oil reserves in the North Sea decrease there is an effort to rebrand Aberdeen as Energy Capital of Europe rather than Oil Capital of Europe and interest in the development of new energy sources; and technology transfer from oil into renewable energy and other industries is under way. The “Energetica” initiative led by Scottish Enterprise has been designed to accelerate this process. Aberdeen is a major world centre for undersea petroleum technology.
Lessons for the Pilbara

History is important – it is possible for a community that is underpinned by resources projects to develop diversity and resilience, but there are two essential ingredients: scale and time. The relatively recent resources-driven economic growth in the ancient towns of Stavanger and Aberdeen has built on a long history of industry and establishment. The effects of the resources economy are but the latest chapter in their story – it is not their sole defining element in the way that it is in much newer communities such as Fort McMurray or the Pilbara. They have an existing base of culture and education on which to overlay their resources boom. Fort McMurray is too new and too small to have developed these to any sustainable level.

Scale and longevity have allowed the resource communities of Stavanger, Aberdeen and Antofagasta to develop activities that are outside of the direct natural resources of the local region. Examples are tertiary education (Aberdeen and Stavanger), military bases (Stavanger) and tourism (Stavanger, Aberdeen and Antofagasta).

The example of Antofagasta provides some indication of the elements that might be part of the future for the Pilbara. It is remote and with a challenging environment, but it has a diverse range of minerals to support its economy. It has also been a substantial producer of minerals for over a century and a half. As it has grown its diversification has built on this base, with business tourism an interesting example. It hosts the bi-annual EXPONOR trade fair, “The International Exhibition of the Mining Industry”, organised by the “Asociación de Industriales Antofagasta”, a guild formed by the major copper producers in the region. This show promotes the gestation of clusters, new business and exchanging knowledge and experiences among entrepreneurs from different countries of the world. EXPONOR 2013 brought together over 1,000 exhibitors from 30 countries. It includes technical tours to mining facilities, business round-tables with mining executives, seminars regarding investments in mining projects and technical talks, as well as visits by delegations of executives from mining companies and suppliers; international workshops with foreign mining executives and business networking for exhibitors from international and national pavilions. It claimed to be responsible for over US$750 million in projected business over the next 12 months.

It is noteworthy that each of the selected comparison locations is noted as being higher priced and with a higher cost structure than their respective countries overall. In diversification they have been able to overcome their cost disadvantage by capitalising on particular regional comparative advantage.
<table>
<thead>
<tr>
<th>Region</th>
<th>Major Centres</th>
<th>Population</th>
<th>Main Industry (export)</th>
<th>Others</th>
<th>Climate</th>
<th>Centre of Regional Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>Karratha</td>
<td>Region: 63,000</td>
<td>Iron ore mining</td>
<td>Manganese, gold, salt</td>
<td>Arid: subject to extremely high temperatures and cyclone activity</td>
<td>No, except for local affairs (4 local government municipalities), regional affairs are centred at the State level.</td>
</tr>
<tr>
<td></td>
<td>Port Hedland</td>
<td>Karratha: 24,000</td>
<td>LNG production</td>
<td>Copper; Business tourism, conferences (EXPONOR mining trade fair); Military.</td>
<td>Arid, mild temperatures.</td>
<td>Yes, Antofagasta is capital of Antofagasta Province (second level administrative division of Chile).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Port Hedland: 16,000</td>
<td></td>
<td>Limited</td>
<td>Sub-arctic; extremely cold winters.</td>
<td>No, except for local affairs (municipality of Wood Buffalo) regional affairs are centred at the Alberta Province level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil and gas administration (head office functions) Tourism (130 cruise ships p.a.) Military (NATO Joint Warfare Centre).</td>
<td>Maritime, mild.</td>
<td>Yes, Stavanger is the administrative centre of Rogaland county.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Business and finance; Electronics design and development: Agriculture and fishing research.</td>
<td>Oceanic, mild.</td>
<td>No, regional affairs mostly governed by Scottish Parliament.</td>
</tr>
<tr>
<td>Antofagasta Region, Chile</td>
<td>Antofagasta</td>
<td>Region: 500,000</td>
<td>The Antofagasta Region is the heart of the mining industry, Chile’s main source of export revenue. It represents 53% of Chile’s mining output, led by copper and followed by potassium nitrate, gold, iodine, and lithium. The mining industry accounts for 93.7% of the region’s exports.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fort McMurray</td>
<td>Region: 80,000</td>
<td>Oil sands and heavy oil: Canada’s oil sands contain some 170 billion barrels of oil that can be recovered economically with today’s technology (and perhaps ten times that in total). Canada thus has the world’s third-largest proven oil reserves, after Saudi Arabia and Venezuela.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stavanger</td>
<td>Region: 400,000</td>
<td>The city’s population grew rapidly in the late 1900s, primarily a result of Norway’s booming offshore oil industry. Today the oil industry is a key industry in the Stavanger region and the city is widely referred to as the Oil Capital of Norway.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aberdeen</td>
<td>Aberdeen: 220,000</td>
<td>Aberdeen is the main base and port for the UK north sea off-shore oil industry.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td>Education (post-secondary)</td>
<td>Cultural</td>
<td>Distance to Main Admin and Finance Centre</td>
<td>History / pre-mining activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilbara Region, Western Australia</td>
<td>Some technical training programmes.</td>
<td>Limited</td>
<td>Perth: 1,500 km</td>
<td>Post-European settlement, the area was a very sparsely populated pastoral region until the growth of iron ore mining in the 1960s.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antofagasta Region, Chile</td>
<td>Two major universities plus several small private.</td>
<td>Appropriate to its size, but nothing outstanding.</td>
<td>Santiago 1,375 km</td>
<td>The area has an ancient and on-going indigenous culture. Large scale non-indigenous population growth commenced in the 19th century with the mining of rich nitrate and guano deposits.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athabasca oil sands, Alberta, Canada</td>
<td>Some technical training and tertiary transfer programmes.</td>
<td>Limited</td>
<td>Calgary, 755 km Edmonton, 441 km</td>
<td>The area is only sparsely populated, and in the late 1950s, it was primarily a wilderness outpost of a few hundred people whose main economic activities included fur trapping and salt mining. From a population of 37,222 in 1996, the Fort McMurray and the surrounding region grew to 79,810 people as of 2006.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavanger, Norway</td>
<td>University of Stavanger (8,000 students).</td>
<td>Significant: 2008 European Capital of Culture.</td>
<td>Oslo, 455 km</td>
<td>The town has a long history: it was founded 1125 as cathedral town. The pre-mining economy was based on fish and fish processing; Aberdeen has been continuously settled since ancient times (at least 8,000 years) and a university and cathedral town for many centuries. Traditional industries have been fishing, paper-making, shipbuilding, and textiles.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aberdeen, Scotland</td>
<td>Two major universities; University of Aberdeen founded 1495.</td>
<td>Significant: Aberdeen International Youth Festival, a major international event which attracts up to 1000 of the most talented young performing arts companies. Ranks high in liveable cities measures.</td>
<td>Edinburgh: 200 km</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diversification Projects

A common theme amongst the numerous planning and economic studies for the Pilbara is the need to diversify the local economy if the labour force and therefore the population is to expand.

Alternative base and driver industries apart from minerals and energy are possible. For example the Pilbara has a number of characteristics that provide the potential for the future development of sustainable, commercial scale algae industries. The sunny weather conditions, the vast tracts of non-arable land, matched with the proximity of both sea water and world scale sources of concentrated CO2, provide the ideal inputs for high volume algae production. The Pilbara also houses a number of major industries that are significant consumers of diesel, and these industries provide a natural market for regionally produced algae based biofuels.

However, while the Pilbara has many attractive attributes for the development of algae industries, it also has a high cost operating environment and there are a number of other areas around the world that offer similar potential to the Pilbara in terms of attractive attributes for algae production. Such areas include parts of the Middle East, Southern USA, and North Africa. Global competition from these (and other) areas could materially impact the likelihood of the Pilbara becoming a future site of major algae industry developments. Therefore the establishment of this industry could be regarded as possible, but by no means certain in the region.

The labour resources required to operate a full scale 5,000 ha facility would see the employment of in the order of 200 people. Although a high degree of automation is possible, the efficiency of biological processes such as algae production is highly dependent on operator input and expertise. As such, many of these people would require a biological background, and/or a strong understanding of algae production.

A further spin-off could be the building of a research institute, using the technical input and technical workforce requirements for algae production facilities as a basis for such an institute. However, the effectiveness of research institutes of this type is determined by both the long term commitment of major funding of infrastructure and its ability to attract high calibre researchers. This requires long term commitment in a highly competitive and high risk environment. A more likely path is the establishment of negotiated and managed relationships with existing and internationally recognised research organisations. This would result in a modest number of researchers on site.

Other potential non-mining export sector projects arise for consideration. Those currently identified include:

<table>
<thead>
<tr>
<th>Project</th>
<th>Prospective Employment (operations)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skilled professional</td>
</tr>
<tr>
<td>Bio-fuels Project</td>
<td>5 - 10</td>
</tr>
<tr>
<td>Hi-Tech Greenhouse</td>
<td>5 - 10</td>
</tr>
<tr>
<td>Aquaculture fish farm</td>
<td>4</td>
</tr>
<tr>
<td>Fish processing factory</td>
<td>2</td>
</tr>
</tbody>
</table>
Some or all of these, or variation of them have some prospects of implementation and will be important for the economic diversification of the region. However, it is important to retain a sense of scale for each of these projects: even a very large project (e.g. the algae farm) in full production provides only a modest contribution to employment growth. Assuming all employment multipliers are applied locally and with minimal FIFO employment the full scale algae farm or 200 workers might account for a population increase in the region of only around 500 people. A large number of these projects are therefore required to achieve significant economic diversification of the export driver sections of the economy away from its current resources base and to significantly increase the population to the levels anticipated in the Pilbara Cities programme.

Similar factors working against industry establishment are likely to be relevant in many of the other non-mining sector diversification industries that arise for consideration.

For example:
Regional Development Australia Pilbara:
- Pilbara Report 2012
- Pilbara Regional Plan 2012 – 2017

Pilbara Development Commission / Pilbara Cities Office:
- Pilbara Cities Vision document
- Karratha City of the North Plan
- Pilbara Planning and Infrastructure Framework
- Pilbara Regional Council Plan for the future
- Pilbara Regional Economy

Worley Parsons, Pilbara Algae Industry Study, Pilbara Cities Office, June 2012
Regional Development Australia Pilbara, Pilbara Report 2012
Education
The provision of high quality tertiary education is a critical requirement for the future of the Pilbara. There are a number of precedents for a substantial regional university in a town of the scale of Karratha and larger.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Students</th>
<th>Location / population</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Cook University</td>
<td>11,500 including 1,500 international</td>
<td>Townsville – 175,000</td>
</tr>
<tr>
<td>University of New England, Armidale NSW</td>
<td>Students 17,000, including 12,500 on-line students</td>
<td>Armidale - 26,000</td>
</tr>
<tr>
<td>Charles Sturt University</td>
<td>Multi-campus</td>
<td>Bathurst - 37,000 Goulburn - 30,000 Orange - 38,000 Port Macquarie - 44,300 Dubbo - 39,500 Wagga Wagga - 58,000</td>
</tr>
</tbody>
</table>

One possible model for the establishment of a university in the Pilbara is the Geraldton Universities Centre. This is an independent, not-for-profit, incorporated body, supporting university courses in Geraldton on behalf of a range of universities including CQU, Charles Sturt University and the University of Southern Queensland. It was generated by initiatives from within the Geraldton community.

The Geraldton Universities Centre’s objective is to facilitate, deliver, promote and provide access to university education for people residing in the Mid West. It was established in 2002, has been in its own facilities since 2006, and has 187 graduates and 180 current student enrolments. The population of the wider Geraldton region is around 44,000; the Pilbara population is around 63,000 people.

The University of Western Australia is examining the possibility of establishing facilities in the Pilbara to bolster research, professional development and undergraduate outreach and support. A University of Western Australia (UWA) Pilbara Taskforce is assisting UWA’s Energy and Minerals Institute (EMI) to examine the many areas of the University’s research, professional development and outreach capabilities that could be delivered through UWA Pilbara. Some potential areas include energy and minerals, the Centre for Rock Art Research and Management, the School of Indigenous Studies, the Oceans Institute, the Centre for Social Impact, the Rural Clinical School of WA and Aspire UWA.

The Regional Australia Institute regional comparisons show that the Pilbara has some way to go in the overall level of its secondary education if it is to be competitive and resilient. The recent expansion of Karratha Senior High School upper school facilities gives promise. The increasing size of this school and of Hedland Senior High School gives opportunity to develop a wide range of programmes and develop areas of excellence in secondary education in the Pilbara. An objective is to get these schools to rank amongst the highest in WA in key educational areas; this would help make the two main Pilbara cities a residential place of choice, similar to those Perth suburbs with high ranking secondary schools. Boarding facilities for at least one of these schools would further widen their appeal and enable them to fill a wider regional role.

Tourism
The growth of the tourism sector will be an urgent action for the region from around 2014 on as the construction phase of major projects winds down. Demand for informal FIFO accommodation has underpinned the viability of many of the short-stay establishments in the region. There is likely to be capacity and need to change orientation to tourist demand to maintain business turnover. This will spill over to many other areas of economic activity including retail and food services in the same period.

There are many opportunities to increase tourism as a proportion of the total economy from its current fairly low base. In investigating how this might be achieved it is useful to look at the five ‘A’s of tourism, namely: attractions, amenity, access, accommodation and activities.

Attractions:
A number of tourist attractions are identified in the region, including:
- Burrup Peninsula
- Millstream
- Karijini
- Cossack and Roebourne heritage buildings
- Yaburara Heritage Trail
- Mt Herbert, Wittenoom Road, Chichester Ranges
- The Dampier Archipelago
- The Montebello islands

Many of these are world-class. The region has attractions that can form the basis of a viable and larger tourist industry.

Amenity:
Tourist amenity is variable across the region – it is not as advanced or comprehensive as some of its competitor locations.

Access:
In comparative terms accessibility to the Pilbara is very good – it has good regional road connections and, importantly, busy airports with a range of interstate and intrastate connections and prospects of regular international connections. Airfares are comparatively high and if a discount airline were to operate the routes it would be a tourist advantage.

Accommodation:
The region is not a major established tourist destination in the way that, for example, Broome or Exmouth are. There are a number of reasons why this might be the case:
- Accommodation has been difficult to get and expensive - a FIFO effect;
- The region is not prompted as a tourist destination the same way that certain other regions are; and consequently,
- There are few tourist-oriented resorts and facilities.
Activities:
Tourist activities are comparatively underdeveloped in the region. In large measure they have been crowded out by the activities of the resource industries. An example is the very low availability of boats for tourist operations to off-shore islands in preference for resources off-shore work. This is an opportunity for expansion.

There are many opportunities for an expansion of the tourism sector:

- Better and more facilities for the caravan and camping segment.
  There is an opportunity to examine the possible re-use or re-orientation of existing TWA camps or, at least, the various short stay accommodation facilities which are in and around the major centres in the Shire;
- Expansion of adventure tourism – fishing and diving – in the Dampier Archipelago and Montebello Islands. This would be based out of Dampier and Samson.
- Industrial tourism;
- Burrup rock art; and
- Cruise ships.

There are several requirements to facilitate and enable this. Immediate requirements are:

- An overall coordinated regional tourism strategy;
- Skills development;
- Promotion;
- Link with other areas (e.g. Broome, Exmouth) for packages; and
- Accommodation.

Longer term expansion of infrastructure capability:

- Dampier marina – as a base for adventure tours;
- International airport capacity with direct links to Asian capitals; and
- The ability to cater for cruise ships on a more regular basis at both Dampier and Port Hedland.

A measure of success for the tourism industry in the region would be for it to regularly house industry and academic conferences, including international conferences, of some size. If it could do this it would demonstrate that it has the requisite accommodation, facilities and transport connections to also appeal to a wider tourist market. This would be an objective of a regional tourist strategy.

Investment Projects
Regional Development Australia Pilbara has identified a wide range of investment projects in a broad spectrum of asset classes that are not only vital to future growth but can also offer sound returns on investment. They include:

- **Land and Housing:** The Pilbara Cities growth plans indicate a medium term requirement for more than 15,000 dwellings, predominantly in Karratha and Port Hedland to accommodate the projected residential population in these two locations.
- **Power supply:** Major changes to the existing North West Integrated System (NWIS) are imminent. An immediate additional supply source of at least 100MW is required to meet short term demand through to 2015.
- **Water supply:** The schemes servicing Karratha and Port Hedland are already at capacity and new supply is urgently needed to meet burgeoning demand. Current projections indicate the need for in excess of $1.5 billion for capital investment in the West Pilbara Water Supply Scheme with almost half of this sum required in the period to 2015.
- **Waste water management:** The second Karratha Waste Water Treatment Plant (WWTP) plant is at capacity and needs an estimated $30 million of works for upgrading to cope with increased flows.
- **Waste management:** Critical to the long term growth of the region is the establishment of a suitable Class IV waste management and hazardous waste disposal facility. Sites in the Shire of Roebourne and Town of Port Hedland are currently under investigation for this purpose.
- **Airports:** Airports throughout the region are experiencing a dramatic rise in patronage and upgrades are required at all major locations to handle increased passenger loads.
- **Ports:** Port expansion programmes led by major resource companies are ongoing, yet there is some uncertainty around which players will proceed with developments in the Port Hedland outer harbour and the Anketell Port project. Port Hedland’s Lumsden Point has been identified as a possible location for a marine-based Common User Facility (CUF) consisting of wharves, lifting lay down areas, and repair, maintenance and load-out facilities.
- **Roads:** Significant road transport improvements are required, including the upgrade of the North West Coastal Highway (NWCH) to national highway status, thus, creating a new major supply chain link. Improved port access roads will be required and additional east west linkages connecting inland towns such as Newman, Tom Price, Paraburdoo and the myriad of mine sites to the NWCH and the ports.

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15 TNS Social Research, Study of Caravan Park Development in Western Australia, 2006
The Pilbara is a major contributor to state and national economies. Its per capita productivity is amongst the highest in the nation, yet it is constrained in many ways by limited physical and social infrastructure within the region.

To achieve the Pilbara Cities Vision and establish mature sustainable regional cities, attention must be paid to the enabling environment. To enable sustainable changes, key aspects of the economic environment need to be considered, namely political, economic, social, cultural, technological, (natural) environmental and legal factors. Specifically, this includes legislation, processes, institutions (and their roles); the cost structure for households and businesses to provide the best chance for sufficient investments in construction, housing, infrastructure and economic diversification.

Of these, the cost structure is amongst the most pressing.

The importance of the Pilbara to the overall Australian economy is now well understood, as is the need to diversify its economy and increase population. While the resources sector provides a strong economic base, it is clear that relying on this sector alone will not enable the population to reach the necessary scale to provide the range and quality of services to draw additional population to the region, to sustain it over the long term and to maximise the many opportunities for the region.

The overall strategy for the Pilbara is therefore to increase population to provide scale economies and increase lifestyle factors. This underpins development strategies already in place within the Pilbara by RDA Pilbara, the Pilbara Development Commission and the Pilbara local governments and is now recognised in both State and Commonwealth Government policy.

The Pilbara has many opportunities. These are reflected in policy, on both sides of politics, for substantial development of northern Australia. For example, the Coalition Policy ‘2030 Vision for developing Northern Australia’ includes analysis of opportunities summarised in the following diagram:

<table>
<thead>
<tr>
<th>Trend</th>
<th>Description</th>
<th>Example areas of opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ageing population</td>
<td>• Global life expectancy to rise from 68 to 78 by 2050</td>
<td>• Healthcare: Develop capabilities in advanced healthcare treatment and research</td>
</tr>
<tr>
<td></td>
<td>• Currently 500 million people over the age of 60; expected to rise to 1.3 billion in 2040</td>
<td>• Tourism: Invest in tourism infrastructure in key destinations</td>
</tr>
<tr>
<td>Rising middle class - the ‘Next Billion’</td>
<td>• Explosion in the middle class (1.2 billion people by 2030)</td>
<td>• Education: Develop as a vocational and higher education hub</td>
</tr>
<tr>
<td></td>
<td>• Purchasing power of middle class to reach $16,500 per capita by 2040 (from $2,149 in 1999)</td>
<td>• Agriculture: Cater to increased preference for higher quality foods</td>
</tr>
<tr>
<td></td>
<td>• Desire for quality amongst aspiration class</td>
<td>• Healthcare: Meet demand for international healthcare in the region</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>• Rise of megacities (18 in 2005 to 27 in 2015)</td>
<td>• Resources: Consolidate advantage in iron ore supply</td>
</tr>
<tr>
<td></td>
<td>• 70% of the world’s population to be in cities by 2050</td>
<td>• Education: Serve excess demand for higher educations in the region</td>
</tr>
<tr>
<td></td>
<td>• Significant demand for construction materials, especially steel</td>
<td>• Agriculture: Boost production output to meet increased food volume demands</td>
</tr>
<tr>
<td></td>
<td>• Strain on education, healthcare, food and fresh water supplies</td>
<td></td>
</tr>
<tr>
<td>Security &amp; Sustainability</td>
<td>• Broad increased awareness of sustainability</td>
<td>• Energy: Serve as a clean energy provider to meet domestic and international needs</td>
</tr>
<tr>
<td></td>
<td>• 43% more energy consumption by 2030, with growth in demand for clean energy</td>
<td>• Defence: Locate more of Australia’s defence capabilities in the North</td>
</tr>
<tr>
<td></td>
<td>• Future security of borders and natural assets</td>
<td>• Agriculture and Water: Leverage our clean, reliable abundant water and soil resources</td>
</tr>
</tbody>
</table>
These are familiar opportunities and are recognised in the various Pilbara development strategies.

The Coalition Policy proposes that by 2030 Northern Australia could drive growth by:

- developing a food bowl, including premium produce, which could help to double Australia’s agricultural output;
- growing the tourist economy in the North to two million international tourists annually; and
- building an energy export industry worth $150 billion to the economy, with a major focus on clean and efficient energy, providing major increases to resource exports.

It also sees opportunities to leverage some of Australia’s broader strengths within the region, including:

- establishing world-class medical centres of excellence in the North;
- creating an education hub with world-class vocational and higher education campuses in selected areas; and
- growing Australia’s exports of technical skills related to resources and agriculture into a $7 billion a year industry.

<table>
<thead>
<tr>
<th>Trend</th>
<th>Capitalising on Northern Australia’s strengths</th>
<th>Bringing Australia’s strengths to Northern Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ageing population</td>
<td>Grow the tourist economy</td>
<td>Develop world-class strengths in healthcare and biosecurity</td>
</tr>
<tr>
<td>Rising middle class – the ‘Next Billion’</td>
<td>Develop a food bowl including premium produce</td>
<td>Create education hub</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>Meet future energy demands sustainably</td>
<td>Export technical skills</td>
</tr>
<tr>
<td>Security &amp; Sustainability</td>
<td>Relocate defence capabilities</td>
<td></td>
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</tbody>
</table>

Policy platform:

- Governance & planning
- Population
- Land access

- Infrastructure – ports, rail, road, telecommunications, energy
- Water resources
The strategic implications for these opportunities, as identified in the Coalition Policy, are also consistent with Pilbara region development strategies already in place for the region and its constituent local governments.

The Policy flags the preparation of a White Paper on developing Northern Australia will consider, inter alia, the following policy options that are particularly relevant to the Pilbara:

- Looking to build on existing key urban zones – such as Darwin, Cairns, Townsville and Karratha – with the aim of substantially increasing the population in these areas. To this end, the efficacy and targeting of current relocation incentives and personal and business tax incentives could be reviewed.

- Establishing a Cooperative Research Centre (CRC) responsible for Developing Northern Australia. The CRC would foster the collaboration of research bodies, institutions and individuals across Australia, including the involvement of commercial interests in relevant research and development.

- Relocating relevant components of Federal departments and Commonwealth agencies, such as CSIRO and AQIS, to key urban zones in Northern Australia.

- Examining the range of appropriate private and public education provider options to best develop technical skills in resources, agriculture, tourism, healthcare, infrastructure and education.

Each of these has application in the Pilbara and it is noteworthy that Karratha rates a specific mention as a location for substantial growth.

The policy recognises economic advantages in pursuing urban growth in rural and regional areas, noting that the development of key urban zones provides clear cost advantages for businesses and families through aggregation and subsequent scale economies. It notes that a significant barrier to the development of Northern Australia is the lack of scale economies, which has flow-on impacts on the availability and cost of goods, services and infrastructure in Northern Australia. Higher effective costs in rural and remote areas affect the incentive for families and businesses to relocate to, or remain in, these areas and that sustainable population growth will be fundamental to driving economic growth in Northern Australia as it will allow local businesses to operate at a larger scale and more profitably, as well as providing a much needed labour force to deliver economic growth.

There are therefore signs of a supportive policy environment for Pilbara incentives to expand education, health and government administration services in the region.

The research by RDA Pilbara that documents the substantial cost disadvantage in the Pilbara, its causes and its consequences for residents, businesses and NGO services is outlined in this report.16 There are two main elements arising from this research that could be addressed in policy responses:

1. Differential labour costs; and
2. Accommodation costs. These are partly linked to:
   - labour costs, as well as
   - environmental factors; for example, the costs of building for cyclone and flood conditions; and
   - supply and demand factors

The planning system in the Pilbara influences the latter two elements by ensuring design decisions in the planning stage minimise differential environmental costs and by ensuring land supply meets or is ahead of demand. This is being effective in reducing the large property value increases that the region experienced in recent years.

However, having an impact on labour and other costs requires a wider focus.

The objectives of any mechanism addressing costs generally in the Pilbara must be to:

a) reduce costs relative to the rest of Australia; and
b) maintain international comparative advantage for the region.

Any support mechanism must therefore have both a national and international context.

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16 Imani Development Austral, The Cost Of Doing Business In The Pilbara, April 2013
Several mechanisms are possible to adjust the operating environment to support government policy for expansion of places like the Pilbara. They include:

1. Special Economic Zone

One enabling mechanism to reduce costs and increase investments in the non-resources sector is the creation of a Special Economic Zone (SEZ). These are territories with more liberal economic legislation in comparison with general economic laws of the country. They are becoming more widespread in a wide variety of countries and need to be considered as a component of maintaining international competitiveness. While many countries have set up special economic zones, China has been the most successful in using SEZ to attract foreign capital. In fact, China has even declared an entire province (Hainan) to be an SEZ, although most SEZs are parts of cities or regions. Primarily geared to exporting processed goods, the Special Economic Zones are foreign-oriented areas which integrate science and industry with trade, and benefit from preferential policies and special managerial systems.

The aim is that tax and investment incentives provides a new economic environment, with a wider range of business opportunities, access to highly qualified labour force, as well as natural and energy resources. The overarching purpose of an SEZ for the Pilbara would be to maximise economic growth and contribute to the social sustainability of the region, thus, assisting with the achievement of the Pilbara Cities Vision.

Internationally, Special Economic Zones generally aim to promote increased, streamlined trade through beneficial taxation schemes and reduced customs oversight, but many nuances have developed within this broad framework to accommodate specialised industries, working conditions, country infrastructure, government oversight, and geographies. Some combination of these may be applicable to the Pilbara:

Free Trade Zone

One of the most expansive types of SEZ is a Free Trade Zone (“FTZ”). An FTZ is a geographically fenced-in, tax-free area that provides warehousing, storage, distribution facilities for trade, shipping, and import/export operations in a reduced regulatory environment, meaning they generally have less stringent customs controls and sometimes fewer labor and environmental controls. These zones generally focus on the tangible operations of international trade and many SEZs attract labor-intensive manufacturing.

Export Processing Zone

Another type of SEZ is an Export Processing Zone (“EPZ”). These zones are similar to FTZs in that they encompass large land estates that focus on foreign exports, but they differ in that they do not provide the same degree of tax benefits or regulatory leniency. They instead provide a functional advantage to investors seeking to capitalise on the economies of scale that a geographic concentration of production and manufacturing can bring to a trade region. These zones are beneficial to a host country, if they are successful, because the host country does not have to provide reduced tariffs or regulations but it still benefits from increased trade to the region.

Hybrid EPZs are also geographically delimited zones, but they are broken down into specialised zones that cater to specific industries. In a hybrid EPZ, all industries use the “general” zone’s central resources, but each industry also operates within its own zone created to streamline specialised processes unique to those industries.

Enterprise Zones

Enterprise Zones not only provide manufacturing or production benefits like other SEZs, but they also provide unique benefits of local, centralised development efforts. If a specific industry is well suited for growth in an enterprise zone, it may take on characteristics of an EPZ or a hybrid EPZ, but the Zone’s purpose in promoting trade is secondary to its goal of gentrification and revival. These zones use greater economic incentives than EPZs—like tax incentives and financial assistance—to revitalize an area by bringing trades into the zone that will spur organic, localised development and improve local inhabitants’ quality of life. This organic growth model assumes that improvement of a region’s industry and trade begins at the individual neighborhood level.

Single Factories

Single Factories are special types of SEZs that are not geographically delineated, meaning they don’t have to locate within a designated zone to receive trade incentives. They instead focus on the development of a particular type of factory or enterprise, regardless of location.

Freeports

Freeports are typically very expansive zones that encompass many different goods and service-related trade activities like travel, tourism, and retail sales. The variation of products and services available to a Freeport cause them to be more integrated with the host country’s economy. Most encourage a fully integrated life on-site for those who work in the Freeport, as opposed to just using the SEZ for manufacturing, production and shipping.
Specialised Zones

In addition to Enterprise Zones and Freeports, Specialised Zones have been established to promote highly technical products and services unique to an industry. Many of these zones focus on the production and promotion of science and technology parks, petrochemical zones, highly technical logistics and warehousing sites, and airport-based economies. For example, Dubai Internet City is a specialised zone that focuses solely on the development of software and internet-based services. The Labuan Offshore Financial Centre in Malaysia is another example of a specialised zone that caters mostly to the development of off-shore financial services.

Elements of these in the Pilbara would improve the operating environment and pave the way for substantial economic diversification and regional economic growth. Any measures could be time-limited, with a sunset or review period after a number of years of operation.

Key SEZ ingredients applied to the Pilbara are:

- Clear objectives, with projects encompassing some or all of:
  - Economic diversification;
  - Building on economic base (e.g. downstream processing);
  - Export orientation; and
  - Technical sophistication and innovation.
- Targeted incentives linked to objectives:
  - Company tax;
  - Personal tax; and
  - Financial incentives.
- Active management.
- Realistic timeframes.

2. Zone Allowances within the Personal Taxation System

Australia has had a system of taxation relief for people in remote areas since 1945, via the zone allowance system, with taxation offsets for workers in defined regions of Australia. However, apart from a review in 1981, which resulted in some zone boundary modifications, little has changed since 1945. The zone rebates, while useful to those who receive them, are relatively small and applied unevenly. Importantly, they can apply to the place of work for FIFO workers and are thus not an incentive to increase the residential population of remote areas.

As a mechanism, they can be effective in reducing the tax burden for individuals living in remote areas and thus provide a financial incentive to live there and directly lower labour costs. However, they are in need of review and overhaul. This is recognised in the latest thinking on taxation by the Australian Treasury, as contained in the most recent comprehensive taxation review, the so-called Henry Review. Recommendation 6b of the Report of the review states:

The zone tax offset should be reviewed. If it is to be retained, it should be based on contemporary measures of remoteness.17

There is thus room in the Henry Review to more effectively link zone offsets to Government policy, with the objective of substantially reducing the taxation burden on residents of the Pilbara (and most likely other residents of the northern region). Suggestions made in submissions to the 2010 taxation review provide some indication of how this might be achieved in detail.

They include:

a) Tighten the definition of ‘residency’ in the tax legislation, so that the zone rebate is available only to permanent residents of designated remote areas of Australia. ‘Permanent’ can be defined as being resident in designated remote area or combination thereof, for at least 182 consecutive days in the year. Allowance should be made for split tax years to accommodate teachers, police and other employees that start work in February and finish in November, with their employment split over two financial years.

b) Include all centres with populations of up to 60,000 persons, to ensure the growth of viable main centres is encouraged and to specifically include settlements such as Karratha and Port Hedland.

c) Combine the current four zones into two and substantially increase the rebate available to permanent residents of the zones, with automatic indexation.

18 A R Fullarton, Submission to Australian Treasury Taxation Review, 2008
d) To provide an incentive for tertiary qualified taxpayers to become residents of rural and remote communities, provide a substantial rebate of repayments due under the Higher Education Contribution Scheme/Higher Education Loan Programme (HECS-HELP), as well as a higher zone tax rebate, such that taxpayers with a HECS-HELP debt would have 25% of their liability reduced for each year of residence in an Ordinary Remote Zone and 100% of their liability reduced for a year in a Special Remote Zone.

e) Both Zone tax rebates and HECS-HELP rebate be apportioned by the number of days actually residing in a zone.

f) Exclude entitlement for non-residents now claiming tax zone rebate solely as a result of accumulating 182 days on site (e.g. FIFO workers). 18

g) The taxation relief could be in the form of a tax credit rather than a rebate 19.

3. Company Tax for Small and Medium Enterprises

Company tax options for SMEs operating in the Pilbara may be applicable and would help this sector. For example to encourage inward investment and diversification a corporate tax free period of three years for new small and medium sized entrants to the region could be considered. To improve the viability of all SMEs, a tax rate of 15% per annum instead of the current rate of 30% would assist considerably. This was one basis of the rise in the economic wealth of Ireland in the 1990s and early 2000s period (notwithstanding the ensuing and unrelated problems caused by the GFC).
The Pilbara has a very strong base to build on – it has world-class economic activity and is well connected to the world. It has well established towns that are being upgraded by the day. It has an exciting future, but it must meet some challenges to improve its resilience to inevitable changing circumstances in the future and achieve true longevity and sustainability.

Key overall aims are to substantially diversify the economy and to improve all aspects of liveability. There are many things to do to help this come to fruition. They include:

- Regional governance and coordination - more local autonomy and regional decision making, with better coordination between three tiers of government and specific assistance to the local governments as primary providers of services and facilities; locating more government agencies in the region, or larger cohorts of those already there, would assist this greatly.
- Reducing the cost structure, starting with the costs of both residential and commercial accommodation.
- Education - establishment of a substantial full-service tertiary education capacity and improved secondary school education with a wider choice and variety.
- Upgraded services infrastructure, including a move to international capability at Karratha airport and a common user facility to service extra-regional projects.
- Formulating a digital strategy for the region to enable:
  - Remote and tele-working;
  - Improved viability of basing regional services and administration in Karratha; and
  - Improved e-health and e-education services
- Health: further expansion of health services; incorporation of areas of specialisation;
- Promoting the expansion of aged care services and facilities.
- Actively supporting the NGO sector.
- Promoting the SME sector:
  - Fostering the further development of SMEs in mining and resources support services and the resources value chain;
  - Support to small business development programmes;
  - Fostering incubation projects and support services; and
  - Fostering the development of SMEs in agri-business support services.
- Tourism: Formulate a comprehensive tourism strategy addressing:
  - Attractions, Amenity, Access, Accommodation, Activities;
  - Product; and
  - Marketing.
- Promoting cultural activities and facilities.
- Upgrading the urban environment of key population centres; completing the Karratha town centre upgrade project.
- Investigate the creation of a Special Economic Zone (SEZ) for the Pilbara in order to reduce costs and increase required investments in the non-resources sector.
- Promoting personal and company taxation measures to lower the cost base and promote diversified economic activity in the Pilbara.
- Making FIFO internal to the Pilbara, with the growth of the major centres as a residential base for FIFO workers working on remote projects.