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Business & Property Economics

Economic & Population Review

ISAAC REGION

Economic & Population Review

Prepared for Isaac Regional Council
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CONTENTS

1 Introduction 2
1.1 Background 2
1.2 Study Objectives 2
1.3 Report Structure 3
2 Economic Profile 4
2.1 Overview 4
2.2 Population 6
2.3 Employment Profile 6
3. Key Factors Influencing Population Growth 12
3.1. The Mining Industry 12
3.2. The Agriculture Industry 16
3.3. The Tourism Industry 18
3.4. The 'Sea Change' Phenomenon 19
3.5. The Rise of FIFO and DIDO 19
3.6. Casualisation of the Workforce 21
4. Sub-Region Analysis 23
4.1. Historic Population 27
4.2. Population Scenarios 28
5. Conclusion 35

1 INTRODUCTION

1.1 Background

Norling Consulting has been commissioned by Isaac Regional Council to prepare an Economic and Population Review for the Region.

Isaac Regional Council is seeking to develop a new Planning Scheme for the amalgamated Region which includes the former Shires of Belyando, Broadsound and Nebo. As part of this process, and particularly in response to the recent downturn in Queensland coal mining, Council is seeking input as to the future economic, employment and population prospects of the Region. This will form an important basis for the direction of planning and infrastructure services for the Region.

Norling Consulting is a specialised economic and market research consultancy for the property industry and has considerable experience in undertaking assessments of population reviews and economic analyses for local governments and the private sector across Queensland.

1.2 Study Objectives

The Study objectives are to:

a) Provide Council with a sound understanding of the factors likely to influence economic growth of the Region in the short, medium and long terms;
b) Identify the key opportunities and risks to economic growth and establish a robust strategy for managing and responding to the various growth scenarios the Region may face;
c) Define specific implementation measures to support the preferred economic growth scenario; and
d) Develop a population and employment model that allows Council to understand the composition of its future community and their needs in terms of housing and infrastructure.

1.3 Report Structure

This report is structured as follows:

- *Chapter 1: Introduction* - This Chapter outlines the background, objectives and structure of this Economic and Population Review;
- *Chapter 2: Economic Profile* – This Chapter describes the Isaac Region, its economic performance and key industries contributing to the Gross Regional Product. The Region's population and employment profile is also outlined;
- *Chapter 3: Key Factors Influencing Population Growth* - This Chapter explores the key factors that are likely to influence population growth within the Isaac Region paying particular attention to the key industries that contribute to the economy and other factors that may affect future growth;
- *Chapter 4: Sub Region Analysis* – This Chapter divides the Isaac Region into eleven smaller sub-regions that represent discrete communities. The historic population of each sub region is detailed and population projections are made based upon four different scenarios.
- *Chapter 5: Conclusion* - This Chapter summarises the key findings of this Economic and Population Review and discusses the outlook for the Region.

2 ECONOMIC PROFILE

2.1 Overview

The Isaac Region is located in central Queensland and covers an area of 58,862 square kilometres extending from the western coalfields of the Bowen Basin to the coastline and islands in the Coral Sea. Moranbah is the major administrative and service centre of the Region and is geographically central within the Region. Other key centres include the mining towns of Middlemount, Dysart and Glenden as well as the historic communities of Nebo, Clermont and St Lawrence.

In an economic sense, the Isaac Region lies within Mackay Region's sphere of influence, with most of Isaac's population living within 250km of the large city of Mackay, which is also the major service centre for the coal mines located in the Isaac Region.

Figure 2.1: Isaac Region

Source: Google Maps

Gross Regional Product (GRP) is considered to be the most appropriate measure of the Region's economic performance. The estimated GRP for the 2011/12 year was $11.8 billion as shown in TABLE 2.1.

TABLE 2.1 Gross Regional Product, Isaac LGA 2011-12

#	Industry	Level ($ million)	% of total
1	Mining	9,106.8	77.4%
2	Construction	212.0	1.8%
3	Agriculture, Forestry and Fishing	97.2	0.8%
4	Transport, Postal and Warehousing	68.8	0.6%
5	Wholesale Trade	62.4	0.5%
6	Manufacturing	59.4	0.5%
7	Accommodation and Food Services	50.5	0.4%
8	Education and Training	45.2	0.4%
9	Public Administration and Safety	44.8	0.4%
10	Retail Trade	43.6	0.4%
11	Administrative and Support Services	39.0	0.3%
12	Professional, Scientific and Technical Services	37.1	0.3%
13	Health Care and Social Assistance	31.2	0.3%
14	Other Services	29.4	0.2%
15	Financial and Insurance Services	24.5	0.2%
16	Rental, Hiring and Real Estate Services	27.0	0.2%
17	Electricity, Gas, Water and Waste Services	21.7	0.2%
18	Non Classifiable Industry	16.7	0.1%
19	Information Media and Telecommunications	7.1	0.1%
20	Arts and Recreation Services	1.6	0.0%
	Total Industry Value Added	**10,026.0**	**85.2%**
	Ownership of dwellings	1,009.1	8.6%
	GRP at Factor Cost / Total Factor Income	**11,035.1**	**93.8%**
	Taxes less subsidies on production and imports	736.8	6.3%
	Statistical Discrepancy	-8.7	-0.1%
	Gross Regional Product	**11,763.2**	**100.0%**

Source: Lawrence Consulting, Norling Consulting

The Isaac Region generated approximately 4.1% of Queensland's Gross State Product in 2011/12. The major industry in the Region by a significant margin was mining, which accounted for 77.4% of GRP. The next closest industry in terms of its contribution to GDP was construction with only 1.8% (the construction sector includes elements of mining, tourism and population growth).

2.2 Population

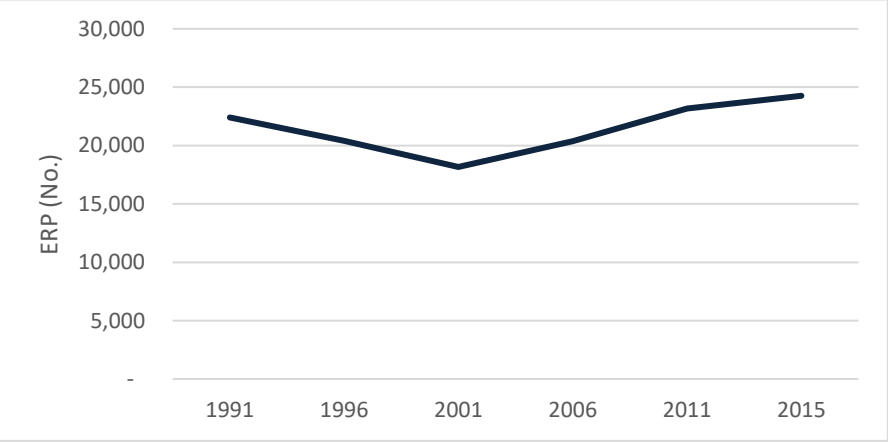
The resident population of the Isaac Region has waxed and waned with the fortunes of the coal industry. Between 1991 and 2001, the Isaac Region population fell from 22,400 persons to 18,169 persons. The resident population then grew to 23,188 persons in 2011 and increased again in 2015 to reach a population of 24,267. These fluctuations make planning for the future a challenge, particularly for infrastructure expenditure. Table 2.2 below sets out the historic population for the Region between 1991 and 2015.

TABLE 2.2: Isaac Region Historical Population

	1991	1996	2001	2006	2011	2015	% p.a. 1991-2015
ERP	22,400	20,397	18,169	20,372	23,188	24,267	0.3%
Households	7,344	6,800	6,485	7,165	8,124	7,889	-
Persons per household	3.05	3.00	2.80	2.84	2.85	3.08	-

Source: ABS and Norling Consulting's estimates

FIGURE 2.2: Isaac Region Historical Population



Source: ABS and Norling Consulting's estimates

2.3 Employment Profile

The following Table 2.3 provides a historic breakdown of Isaac residents who were employed at the time of the 2001, 2006 and 2011 Cehnsuses.

TABLE 2.3: Resident Worker Growth Isaac Region 2001 to 2011

	2001	p.a. growth	2006	p.a. growth	2011
Isaac Region	9,633	4.2%	11,845	3.3%	13,962

Source: 2001, 2006 and 2011 ABS Household and Population Censuses, based on place of usual residence

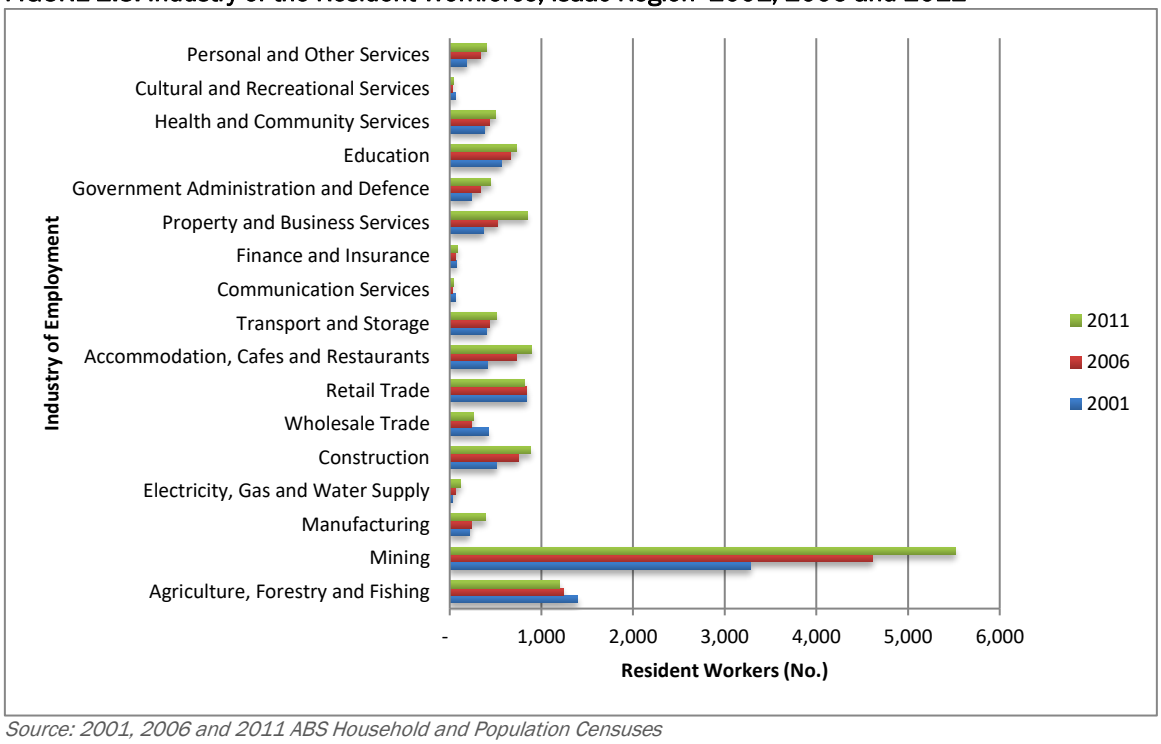
As illustrated above, the number of resident workers within the Isaac Region has increased significantly during the 2001 and 2011 period, even through the Global Financial Crisis.

Labour force participation rates have improved over the 2001 – 2011 decade, increasing from 79.3% in 2001 to 84.4% in 2006 and to 87.0% in 2011. Unemployment rates within the Isaac Region have also improved between 2001 and 2006 reducing from 3.6% to 2.1% and remained at the similar low level of 2.0% to 2011. Since the 2011 Census, the unemployment rate has remained at 3% or below, with the latest March Quarter 2016 rate being 2.7%.

With the population fluctuating during the 2001 – 2011 period, such positive employment growth is the result of increased jobs available within the mining industry with new and expanding coal mines.

The following FIGURE 2.3 illustrates how the industries of the Isaac Region workforce have trended since 2001.

FIGURE 2.3: Industry of the Resident Workforce, Isaac Region- 2001, 2006 and 2011



Source: 2001, 2006 and 2011 ABS Household and Population Censuses

Figure 2.3 is also documented in more detail in in the below Table:

TABLE 2.4: Industry of the Resident Workforce, Isaac (R) - 2001, 2006 and 2011

	2001 (No.)	2006 (No.)	2011 (No.)	Difference between 2001 - 2011
Agriculture, Forestry and Fishing	1,391	1,238	1,195	- 196
Mining	3,286	4,608	5,512	+ 2,226
Manufacturing	215	238	388	+ 173
Electricity, Gas and Water Supply	35	64	117	+ 81
Construction	509	754	877	+ 368
Wholesale Trade	418	239	259	- 159
Retail Trade	840	840	811	- 29
Accommodation, Cafes and Restaurants	417	727	890	+ 473
Transport and Storage	401	430	510	+ 110
Communication Services	60	29	42	- 18
Finance and Insurance	72	60	88	+ 16
Property and Business Services^	366	525	843	+ 477
Government Administration and Defence	232	341	442	+ 210
Education	566	663	730	+ 165
Health and Community Services	376	429	503	+ 127
Cultural and Recreational Services	65	27	40	- 25
Personal and Other Services	188	334	398	+ 210
Inadequately described/Not stated	195	299	316	+ 121
Total	**9,633**	**11,845**	**13,962**	+ 4,329

Source: 2001, 2006 and 2011 ABS Household and Population Censuses, Norling Consulting Estimates
^includes rental hiring and real estate services, professional, scientific and technical services and administration and support services

The figure and table above again highlight the importance of the mining industry to the Isaac Region, with 40% of employed persons working within this industry. Agriculture is the next most important industry, although the total jobs for this industry has declined by almost 200 between 2001 and 2011.

As shown above, the major increases have occurred within the mining (2,226 persons); property and business services (increase of 477 persons) and accommodation, cafes and restaurants (increase of 473 persons) sectors.

The majority of decreases have occurred within the agriculture, forestry and fishing industry, with 196 fewer jobs in 2011 than in 2001, which is consistent with the industry's technological shifts that are reducing reliance on manual labour, as well as the higher wages on offer in the mining sector attracting workers from the agriculture sector.

While the above analysis was based upon the Isaac Region resident workforce only, another important indicator is the number of jobs within an area, irrespective of where the workers lived. An estimated 24,049 jobs were provided within the Isaac Region in 2011. The following TABLE 2.5 illustrates the historical workforce between 2001 and 2011, based on the results of the ABS Household and Population Censuses.

TABLE 2.5: Jobs within Isaac Region 2001 to 2011

	2001	p.a. growth	2006	p.a. growth	2011
Isaac Region	11,183	8.4%	16,749	7.5%	24,049

Source: 2001, 2006 and 2011 ABS Household and Population Censuses, Norling Consulting estimates

Within the Isaac Region, the rate of jobs growth throughout the entire 2001 - 2011 period significantly exceeded the population and resident worker growth rate, driven by a rapid expansion of the coal mining sector and an increasing propensity of workers to live remotely from their place of work (resulting in the concepts of FIFO [fly-in-fly-out] and DIDO [drive-in-drive-out]).

A comparison of TABLES 2.3 and 2.5 reveals the net jobs balance for the Region, which measures the proportion of jobs supplied in the Region to the number of workers residing in the Region. A net jobs balance of less than 100% means that fewer jobs are supplied than there are workers residing in the Region – implying a net export of workers to jobs located outside the Region. A net jobs balance greater than 100% means that there are more jobs within the Region than there are resident workers. The net jobs balance for the Isaac Region is estimated below:

TABLE 2.6: Jobs within Isaac Region 2001 to 2011

Year	Jobs Balance
2001	116.1%
2006	141.4%
2011	172.2%

Source: 2001, 2006 and 2011 ABS Household and Population Censuses, Norling Consulting estimates

The above net jobs balance estimates shows a trend within the Region of increasingly generating a greater amount of jobs than required to support the number of resident workers. This is clearly influenced by the number of jobs within the Bowen Basin and workers living outside the Region on a FIFO/DIDO basis.

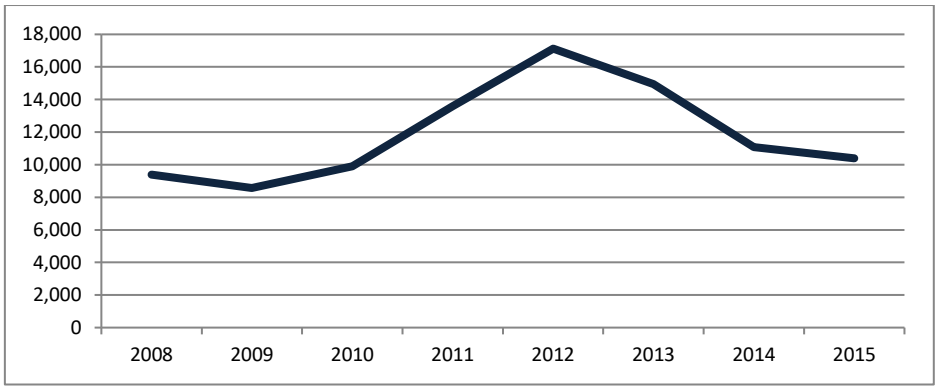
As reflected in the net jobs balance, the Isaac Region hosts a large number of non-resident workers (comprising a very significant two-thirds of all Bowen Basin non-resident workers). These are the workers who live in the area temporarily while rostered on but have their usual place of residence elsewhere. The following TABLE 2.6 highlights these estimates:

TABLE 2.7: Non-resident Workers On-shift*

LGA	2008	2009	2010	2011	2012	2013	2014	2015
Isaac (R)	9,380	8,570	9,905	13,590	17,125	14,950	11,085	10,400

**due to shift arrangements, not all members of the non-resident workforce are present in the local area at the one time. The figures therefore reflect the average number of non-resident workers on-shift, rather than total non-resident workforce numbers.*
Source: Queensland Government Statistician's Office

FIGURE 2.4: Non-Resident Workers On-shift*



**due to shift arrangements, not all members of the non-resident workforce are present in the local area at one time. The figures therefore reflect the average number of non-resident workers on-shift, rather than total non-resident workforce numbers.*
Source: Queensland Government Statistician's Office

Queensland Government Statistician's Office estimated that in 2015 there were a total of 10,400 non-resident workers within the Isaac Region, a total that has fallen each year from the 2012 peak of 17,125. Much of the decline in the non-resident population since 2012 is due to the finalisation of the construction phase of new projects and the departure of those temporary workforces. Softening coal prices and pressures to improve productivity have also influenced reduced workforces with mine closures and restructuring taking place.

The breakdown of the industries of the workforce reveals similar results to the industries of the resident workforce.

TABLE 2.7: Industry of the Jobs, Isaac Region - 2001, 2006 and 2011

	2001 (No.)	2006 (No.)	2011 (No.)	Difference between 2001 - 2011
Agriculture, Forestry and Fishing	1,312	1,362	1,112	-200
Mining	4,075	8,160	13,113	+ 9,038
Manufacturing	355	292	570	+ 215
Electricity, Gas and Water Supply	45	65	137	+ 93
Construction	589	1,361	2,171	+ 1,583
Wholesale Trade	491	240	317	- 173
Retail Trade	952	909	808	- 144
Accommodation, Cafes and Restaurants	476	898	1,297	+ 821
Transport and Storage	487	507	606	+ 118
Communication Services	74	17	44	- 31
Finance and Insurance	88	79	96	+ 8
Property and Business Services^	439	682	1,179	+740
Government Administration and Defence	354	382	506	+ 152
Education	609	704	741	+ 132
Health and Community Services	464	460	528	+ 64
Cultural and Recreational Services	70	32	45	- 25
Personal and Other Services	229	431	605	+ 376
Inadequately described/Not stated	74	168	174	+ 100
Total	**11,183**	**16,749**	**24,049**	**+ 12,865**

Source: 2001, 2006 and 2011 ABS Household and Population Censuses, Norling Consulting Estimates
^includes rental hiring and real estate services, professional, scientific and technical services and administration and support services

Whilst 55% of the total jobs provided within the Isaac Region were within the mining industry (or 13,113 jobs), a significant 70% of the additional jobs provided between 2001 and 2011 were within the mining industry. The construction industry employed the next highest number of workers (2,171 jobs), although this industry overlaps with many others, including mining.

The major increases in the workforce have occurred within the mining (9,038 persons), construction (increase of 1,583 persons) and accommodation, cafes and restaurants (increase of 821 persons) sectors.

The majority of decreases have occurred within the agriculture, forestry and fishing industry, with 200 fewer jobs in 2011 than in 2001, which is consistent with the industry's technological shifts that are reducing reliance on manual labour as well as the higher wages on offer in the mining sector attracting workers from the agriculture sector.

3. KEY FACTORS INFLUENCING POPULATION GROWTH

This Chapter explores the key factors that are likely to influence population growth within the Isaac Region paying particular attention to the key industries that contribute to the economy and other factors that may affect future growth.

3.1. The Mining Industry

The Isaac Region is heavily dependent upon the mining of coal, with the Bowen Basin extending through the middle of the Region in a north-south direction and the northern part of the (as-yet) undeveloped Galilee Basin extending into the far west of the Region. There are approximately 25 coal mines currently operating in the Region. As identified in the previous Chapter, mining accounted for 55% of all workers working in the Region as at August 2011. The Isaac Region has also recorded the highest levels of non-resident workers in Queensland, with a peak of 17,125 workers recorded in June 2012. By June 2015, this figure had dropped to 10,400, yet the Region's proportion of the Bowen Basin's non-resident workforce still represented two-thirds of the total.

The mining industry contracted across most key indicators in 2014-15, as detailed by the ABS. Industry value decreased 7.4% ($9.4billion) to $118.3b in 2014-15. The mining division export price index fell 21% between 2013-14 and 2014-15, driven by falling prices for high quality metallurgical coal, thermal coal and iron ore, and impacting on sales and service income and industry value added. Employment and wage growth also decreased over this period.

Despite the current downturn in the industry, proposals for other new coal mining projects are continuing. However, it appears that the majority of the new projects are located outside the Region, namely within the southern part of the Bowen Basin or in the Galilee Basin. Projects within the Region that may increase the Region's production, include the following:

(a) Eagle Downs, just south of Moranbah, is a new underground mine that has had its construction suspended pending an improvement in the coal price. It was proposed to produce an annual volume of 7Mt of coking coal.

(b) Byerwen, located just north of the Newlands mine and serviceable by Moranbah, is a resource of coking and thermal coal of more than 500Mt that is proposed to be mined by both open cut and underground methods and to average an annual production volume of 10Mt. It is understood that construction of the stage 1 operations has just commenced.

(c) Moranbah South is a proposed underground coal mine located near Moranbah with a proposed annual capacity of 14Mt.

(d) Blair Athol, near Clermont, has recently been sold to a junior miner for $1, with plans for it to reopen shortly with a workforce of 100 workers. This mine is understood to have a short life, with the resource being nearly exhausted.

(e) Isaac Plains, near Moranbah, has just reopened following its purchase by Stanmore Coal for $1. There are plans to move operations to the neighbouring Isaac Plains East resource once Isaac Plains has been exhausted.

(f) Norwich Park, near Dysart, has been rumoured to be considered for reopening, provided that low cost workers could be sourced.

(g) The Hillalong Coal Project is a proposed new coal mine located approximately 60km northwest of Nebo. Two open cut pits and two underground longwall mines are proposed that would produce 4.2Mt per annum and the life of the project is estimated at 17 years.

(h) Broughton, 30km northwest of Nebo is a proposed single open cut pit. The mine is projected to produce up to 3Mt per year for approximately 15 years.

(i) The New Lenton Project is an open-cut coal resource located 65km northwest of Nebo. There is already an approval to mine 2Mt of run-of-mine coal due to start construction in 2016. It is proposed that the production rate is increased to 8Mt by mining adjacent land. With this expansion, the overall project is estimated to have a lifetime of 25 years.

(j) Ellensfield is a project 35km northeast of Moranbah involving the development of a new underground coal mine producing up to 3Mt per year of semi-soft coking and thermal coal for export.

(k) Red Hill, a new underground coking coal mine 20km north of Moranbah has been approved along with an extension to the Broadmeadow underground mine and the open cut Goonyella Riverside Mine.

(l) The Codrilla Project is a proposed open cut coal mine to be located 45km south west of Nebo. An average annual production rate of 2.7Mt is expected with 16 years of production expected. It is anticipated that ongoing exploration may identify additional resources enabling the mine to extend its operating life beyond this.

In addition to these proposed new projects, it is expected that a number of the existing mines would increase production levels once demand increases and the price increases. In contrast, several mines are due for closure including Burton (late 2016), Newlands (mid-2016), Moorvale (2016),

With coal prices recently plumbing to new lows, there is little optimism at present that the previous boom times will return in the near or medium term. It is noted that there has been a slight increase in the coal price during mid-2016. However, that rate of increase is not expected to continue, with the projections prepared by various reputable authorities basically indicating that the coal price will only increase marginally over the next five years or so.

In the longer term, climate change mitigation efforts will have a larger bearing on the future of coal with the demise of the Queensland coal industry expected by about 2040 if the industry cannot reduce carbon emissions from the burning of coal by at least 95% at an economical price. Carbon capture and storage is a key technology in reducing greenhouse gas emissions, although more research is required before this method is viable. However, if the industry can meet this challenge, it is likely that coal will continue to be an important source of energy for many more decades, cementing the future of the Bowen and Galilee Basins for many more decades.

It is Norling Consulting's view that the most likely scenario is for a continuation of existing production levels in the short term, with a reasonable prospect for a small increase in employment over the next decade. There is also a reasonable prospect that production and employment levels would reduce post-2030.

3.1.1 Technology Advancements in the Mining Industry

Technological advancements in the mining industry are also likely to impact on the workforce. Following the downturn, companies are increasingly looking for ways to minimise costs of production and labour. According to 'Tracking the Trends 2016' by Deloitte, the following technologies could significantly change the future of the mining industry:

- **Networks**: It is becoming more cost effective to use sensors connected to the internet and each other to collect data on mining equipment. This could allow cloud-based, integrated IT platforms to share operational data with suppliers and eliminate unplanned maintenance and downtime.
- **Machine learning**: The growing 'intelligence' of robotic process automation and autonomous vehicles will result in machines performing increasingly complex and hazardous tasks. This is likely to reduce labour costs and improve safety and productivity. Ultimately, it may be possible to operate mines completely autonomously, concentrating workers in a central hub instead of at a remote region.
- **Genomics**: Surprisingly, medical gene research can have relevant applications in the mining industry. While still a relatively new concept, bacteria capable of extracting minerals is being researched and using natural enzymes for bio-remediation purposes to clean contaminated sites has already been utilised.
- **Wearables:** Technologies that are incorporated into clothing and accessories can provide significant advantages to the health and safety of workers and to overall production costs. For example, wearable devices can track driver fatigue of truck-drivers to prevent accidents and pin-point the location of underground workers allowing operators to heat or cool only occupied areas of the mine, reducing energy costs. Signals from wearable devices could also improve response time to workers in the event of an accident or injury.
- **Hybrid Airships:** Lockheed Martin has recently developed and commercialised hybrid airships. With costs currently comparable to truck transport (and much cheaper than via helicopter), the giant airships would enable the haulage of equipment and fuel to remote regions lacking accessible roads.

3.2. The Agriculture Industry

In contrast to the dominance of the coal sector, the agricultural sector employed only 4.6% of total workers working in the Region in 2011, a rate which has declined from 11.7% in 2001. This industry comprises mainly beef cattle, with some sugar cane grown in the coastal part of the Region. Livestock contributes approximately 70% of gross value of commodities, with crops contributing the remainder.

The Isaac Region has two important agricultural areas, as identified by the Queensland Agricultural Land Audit – East Coast (the coastal area of Ilbilbie and Carmilla forms part of this broader area) and The Golden Mile (located around Dysart and Middlemount). The East Coast is an important area for the growing of sugar cane, but is also recognised as being a high pasture-growth area, with the potential for horticulture and plantation forestry. The Golden Mile is an area of high-quality soils along the Isaac, Conners and Mackenzie Rivers that provide very high quality grazing and dryland cropping. The Land Audit notes that this area has the potential for further expansion into irrigated cropping and horticulture if water and transport was made available.

Queensland cattle farmers have endured a long period of drought, with parts of the Isaac Region remaining 'drought declared.' However, rains in parts of the state have increased demand for cattle, resulting in strong cattle prices. Prices are likely to remain high until farms achieve adequate stocking rates. The beef industry is viewed as a stable industry, with rainfall being the key arbiter of fortune for this industry.

The Mackay Isaac Whitsunday Region grows around a quarter of Queensland's sugarcane, with the climatic conditions and good soils producing high sugarcane yields with high sugar content. This wider Region provides an established sugarcane tramway network, five sugar mills and port facilities for exporting. There is also a sugar refinery located at Mackay's Racecourse Mill that produces food-grade sugar and an ethanol plant that can produce up to 60ML of ethanol per year. Some mills are establishing facilities to produce bio-products such as furfural and to use bagasse for the cogeneration of electricity.

The current mill infrastructure has the capacity to process additional sugarcane if there is an expansion of sugarcane production. There are also opportunities for other by-products of sugar cane processing such as the production of bio-plastics. The closest sugar mill to the Isaac Region is Plane Creek Mill at Sarina.

Within the Isaac Region, sugar cane is grown at Ilbilbie and Carmilla. There appears to be an opportunity for an expansion of sugar cane in this part of the Region, although other parts of the Region appear unsuitable.

Within the Region, grain crops are grown mostly as feed stock for local cattle feedlots. Extensive dryland cropping, primarily sorghum in summer and legumes and wheat in winter, occurs in the western areas near Clermont and Dysart and surrounding the junction of the Isaac and Connor's River. Grain from these areas is transported via rail or road at the Mount McLaren grain depot near Clermont.

A reliable water supply would significantly improve the value and production of agriculture throughout the Region and create further opportunities for irrigated cropping and horticulture.

Aquaculture is also present within the Region with Australian Prawn Farms at Ilbilbie harvesting 40 tonnes of tiger prawns from 33 hectares of ponds per week. St Lawrence is also well known for its mud crabbing industry with stock transported directly to Sydney for consumption. With much of the Isaac Region's coastline undeveloped, there may be further opportunities for the aquaculture industry to expand, particularly in the St Lawrence area, however, environmental regulations related to the protection of water quality in Great Barrier Reef waters may pose a significant challenge to realising such opportunities.

3.3. The Tourism Industry

The Isaac Region, in particular the coastal part of the Region, is identified as an emerging tourism precinct in the Mackay Destination Tourism Plan 2014 - 2020.

Commercial fishing and aquaculture operations are located in the coastal areas and several 'trails' connect throughout the Region. 'The Mining Trail' extends from Mackay to Clermont and 'The Great Inland Way' connects Clermont to Charters Towers, presenting visitors with the opportunity to experience the rich culture of early European settlers in the area. 'The Copper Trail' connects the inland town of Clermont to the coastal community of St Lawrence, closely following the historical route used to transport copper and other commodities from the hinterland to the then Port of St Lawrence.

Tourism data is available for the Isaac Region as average annual data from year ending December 2009 to December 2012 (averaged over a four year period to increase the stability of the data). The Isaac Region is included within the Mackay Tourism Region as defined by Tourism and Events Queensland. While more recent data is available for the Mackay Tourism Region, given the Isaac Region's small portion of visitors, it is considered that the totals would not be well representative of the Isaac Region. Therefore, this section outlines the average annual data of the Isaac Tourism Profile for the December 2009 – 2012 period.

During this time there was an average of 166,000 domestic overnight visitors to the Isaac Region staying for a total of 591,000 nights. The main purpose of their visit was for business (69%), followed by visiting friends and relatives (13%) and holiday (11%). The major type of transport used to access the Region was by motor vehicle (80%). 10% of visitors arrived via air transport and only 2% by bus or coach. This data indicates that DIDO miners dominate the domestic overnight visitor market rather than traditional tourists.

There was an average of 5,000 international overnight visitors to the Region staying for a total of 104,000 nights and representing an average stay of nearly 20 nights.

It was estimated that 202,000 day trips were made to the Region during this period, of which the main purpose of the trip was for business (42%). The main Regions of origin were the Mackay Region (59%) and Central Queensland (25%).

Thus tourism (excluding DIDO workers and other business travellers) within the Isaac Region is a very small market. Some growth is expected in this market from a small base, with the Region's share of this tourism market considered to be dependent upon travel to and from other destinations, such as Mackay and Emerald.

3.4. The 'Sea Change' Phenomenon

The 'sea change' phenomenon is a term used to describe the increasing settlement of the Australian coast, particularly those areas outside the primary urban metropolitan centres. This migration to rural coastal settlements has been driven by the desire to seek a better lifestyle and improved quality of life, particularly by middle-aged and older Australians.

While the Isaac Region has not experienced population growth resulting from the sea change phenomenon so far, the nearby community of Sarina has been a beneficiary of modest population growth, although it is difficult to separate the growth attributed to purely people seeking a sea change or as a result of the mining boom. The Isaac Region's coastal settlements (Ilbilbie and Carmilla) may appeal to this market in the medium to longer term, but do not currently have the critical population mass to support an appropriate range of services. It is therefore not recommended that future population growth should be encouraged unless a commensurate provision of services is planned and instigated.

3.5. The Rise of FIFO and DIDO

The resource sector requires employees to work in geographically isolated areas. In the past, mining companies have sourced workers from a mixture of local residents and FIFO/DIDO (non-resident workers). There is now, however, a movement away from this workforce structure with an increased proportion of FIFO and DIDO workers. For example, BHP Mitsubishi Alliance secured Queensland government approval for a 100% FIFO workforce for its Caval Ridge and Daunia Mines, near Moranbah. Furthermore, it was specified that employees would only be sourced from Cairns or Brisbane, excluding local workers and permanent relocation as an option.

Increased FIFO and DIDO could have significant impact upon resource communities including the following:

- Fewer jobs available for local residents meaning residents may have to relocate to find work.
- Lack of integration between resident and non-resident workers creates a strong 'us vs them' mentality, negatively impacting on the identity and sense of community of resource towns.
- The non-resident workforce is not included in the data used to assess critical infrastructure and essential requirements. This can place additional pressure on infrastructure and services including the road network, health and emergency services.

There may also be negative impacts upon the FIFO/DIDO workers themselves, with this form of work linked to increased divorce rates, increased prevalence of social and criminal issues such as domestic violence, alcoholism, gambling and impaired physical and mental health.

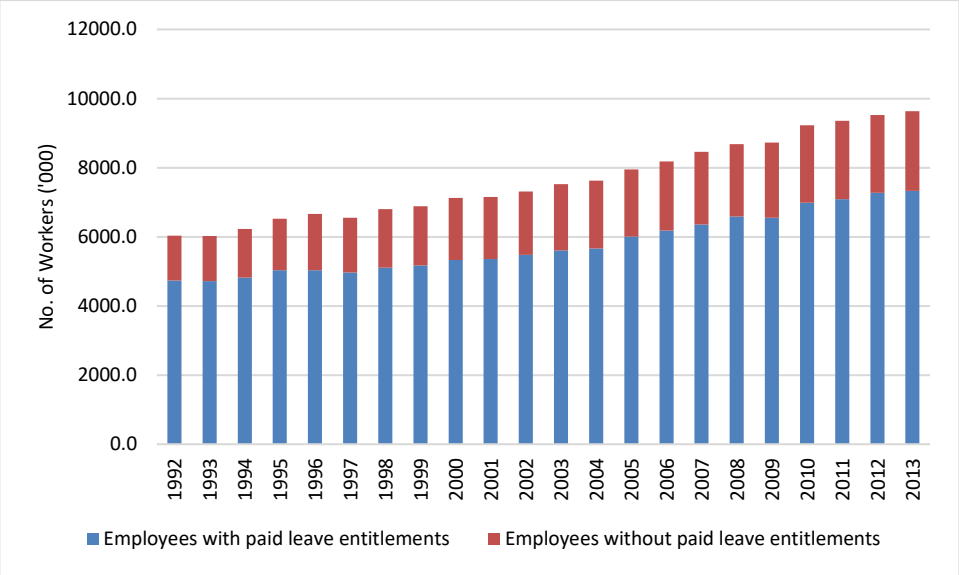
Following a parliamentary enquiry into 'FIFO and other long distance commuting work practices in regional Queensland', the State Government is currently undertaking work to legislate a prohibition on a 100% FIFO operational workforce and discrimination against locals during the recruitment of new workers. The Strong and Sustainable Resource Communities Bill is understood to be introduced to parliament later this year. The Draft Bill introduces the proposed *Strong and Sustainable Resource Communities Act 2016* which would require the owners of large resource projects to prepare social impact assessments for their projects, to employ people from nearby communities and not to discriminate against residents from nearby regional communities when employing for the projects. This would also include a prohibition on 100% FIFO workers for large resource projects that have a nearby regional community.

Whilst these belated state government initiatives may redress some of the negative consequences of the FIFO and DIDO workforces, the underlying trend appears to remain entrenched: employers prefer to maximise FIFO and DIDO employment in comparison to local workforces.

3.6. Casualisation of the Workforce

An analysis of Australian Bureau of Statistics data from 1992 to 2013 (ABS Cat. No. 6105.0), reveals that the overall proportion of casual workers (workers without paid leave entitlements) has grown by a small amount over this period (2.4 percentage points) from 21.5% in 1992 to 23.9% in 2013. There have been some fluctuations during this period with a peak of 25.7% reached during 2004.

FIGURE 3.1: Australian Workforce – Employees With and Without Paid Leave Entitlements

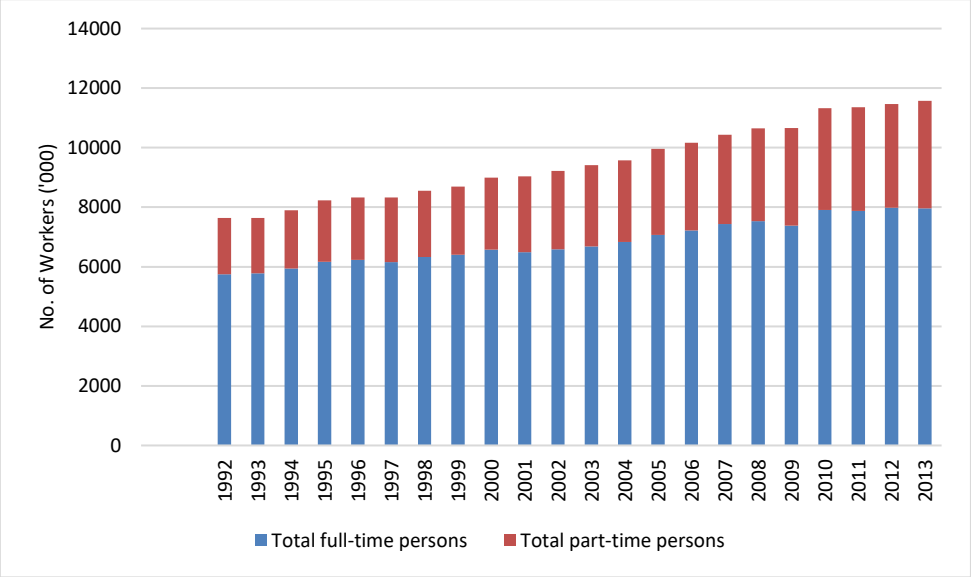


Source: ABS Cat. No. 6105.0

More significantly, the age distribution of those employed casually has changed, with workers below the age of 30 increasingly working casually. In 1992, 26% of employed persons below the age of 30 were casual workers. In 2013, this proportion had increased to 37%.

While the proportion of casual workers has increased by a small amount over the past two decades, the proportion of persons working part-time has also increased, with 25% of the workforce being part-time in 1992 and increasing to 31% in 2013.

FIGURE 3.2: Australian Workforce – Full time and Part time



Source: ABS Cat. No. 6105.0

Another change relevant to the workforce is that there is no longer the 'job for life' or 'career for life' mindset. While many older workers left school or university, found a job, and remained there for the rest of their working life, younger people are more willing to change employers and industry sectors. Such changes are the result of people seeking to enhance their career, obtain increased remuneration or through a change in career. Such an outlook by workers results in the preference to live somewhere that has a range of potential employers, i.e. cities or major metropolitan areas.

This general move to a casualisation of the workforce is considered to favour population growth in the major cities (that provide a wider range of employment opportunities) in comparison to regional areas.

The resource sector may increasingly follow the global trend towards the casualisation of workforces with a growing proportion of jobs filled by contractors instead of permanent positions. Influenced by market volatility and the need for workforce flexibility, in the Pilbara, Rio Tinto announced in July 2016 that it would only hire contract labour for its iron ore operations. There are concerns that this will impact upon the town with contractors unwilling to move to the town given the lack of job security.

4. SUB-REGION ANALYSIS

For planning purposes, the Isaac Region has been divided into eleven smaller sub-regions which represent discrete communities and have been defined based upon:

- The ABS's Statistical Area 2 (SA2) and Statistical Area 1 (SA1) boundaries;
- Natural and engineering constraints;
- Planning and infrastructure limitations; and
- Discussions with Council staff.

The eleven sub-regions are described below and are illustrated in Figures 4.1 and 4.2 following the below descriptions:

1. Moranbah

   This area comprises the SA2 of Moranbah, which includes the town and the surrounding rural area.

2. Clermont Town

   This area comprises six SA1s (3133901, 3133902, 3133903, 3133904, 3133905, 3133906) to form the township of Clermont.

3. Clermont Rural

   This area comprises three large rural SA1s (3133907, 3133908, 3133909) that surround the township of Clermont. The combination of Clermont Town and Clermont Rural equals the SA2 of Clermont.

4. Ilbilbie

   Ilbilbie comprises a single SA1 (3133826) in which the Ilbilbie township and surrounding rural area is contained.

5. Carmilla

   Carmilla comprises a single SA1 (3133811) in which the Carmilla township and surrounding rural area is contained.

6. St Lawrence

St Lawrence comprises a single SA1 (3133821) in which the St Lawrence township and surrounding rural area is contained.

7. Nebo

The Nebo township comprises two SA1s (3133808, 3133828).

8. Glenden

The Glenden township comprises three SA1s (3133804, 3133805, 3133806).

9. Middlemount

The Middlemount township comprises six SA1s (3133802, 3133803, 3133822, 3133823, 3133824, 3133825).

10. Dysart

The Dysart township comprises eight SA1s (3133801, 3133813, 3133814, 3133815, 3133816, 3133817, 3133818, 3133819) plus a small encroachment into a large rural SA1 (3133820).

11. Nebo Rural

Nebo Rural comprises the remaining five rural SA1s that are located in the SA2 of Broadsound – Nebo (3133807, 3133809, 3133810, 3133812 and the remainder of 3133820). That is, Ilbilbie, Carmilla, St Lawrence, Nebo, Glenden, Middlemount, Dysart and Nebo Rural comprise the SA2 of Broadsound – Nebo.

FIGURE 4.1: Isaac Sub-regions

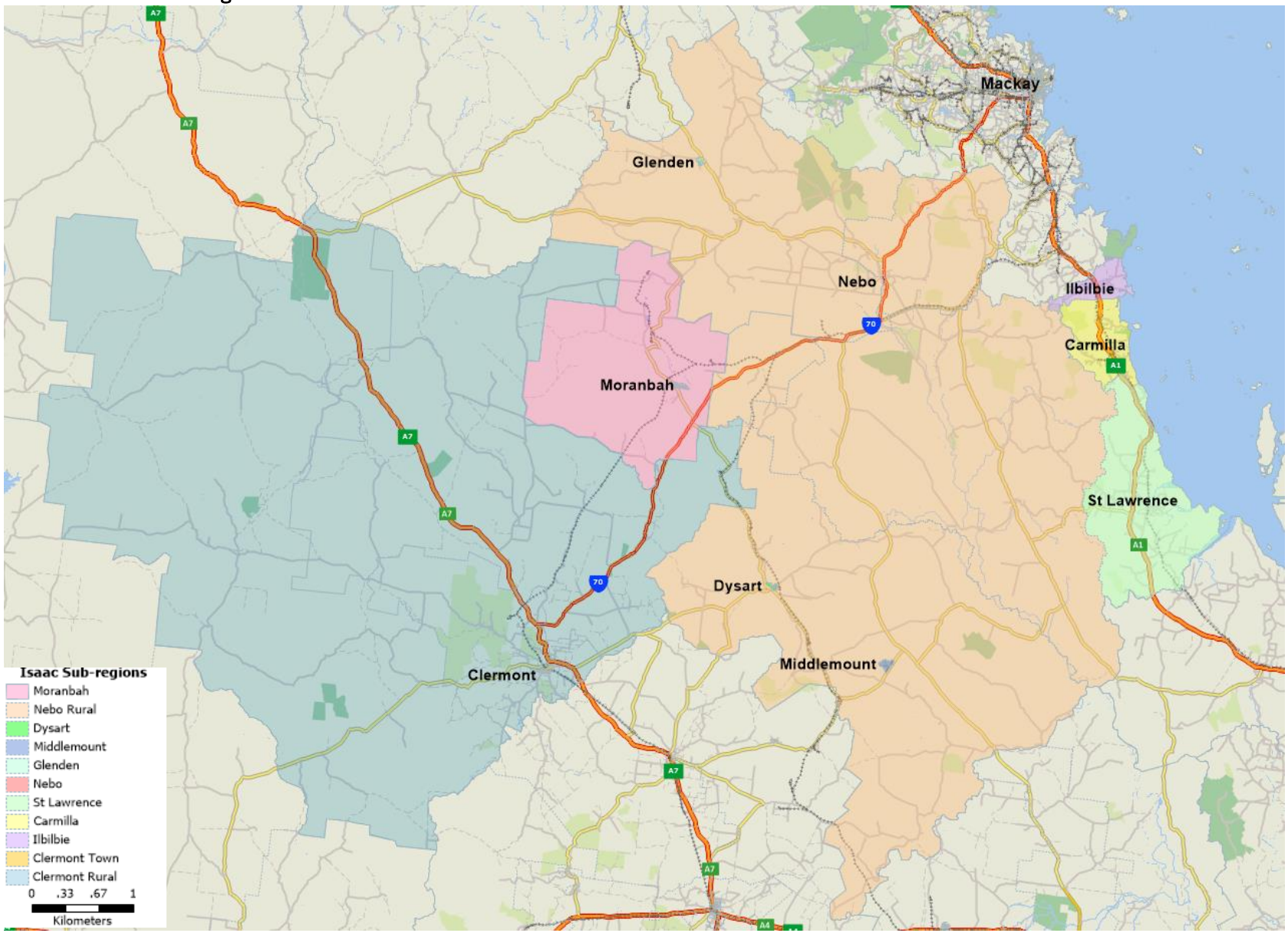


FIGURE 4.2: Town Sub-regions

Source: Maptitude, Norling Consulting

4.1. Historic Population

The resident population of the Isaac Region has fluctuated alongside the fortunes of the coal industry. The following Table shows the historic population of the eleven sub-regions from 2001 to 2015, according to the ABS population and household censuses and the ABS's Regional Population Publication (2015 population estimate).

The 2015 ABS estimates for the Region have been scrutinised to ensure it does not include the significant amount of vacant dwellings throughout the region. An analysis of data from the 2011 census of unoccupied dwellings in the region and based upon several sources of information of vacant dwellings (water meter readings from Council and real estate website of available rentals of vacant dwellings) we are confident that the ABS figures have appropriately excluded the significant amount of unoccupied dwellings in the region.

TABLE 4.1: Population Growth 2001 - 2015

	2001 (Act)	Inc. p.a.	2006 (Act)	Inc. p.a.	2011 (Act)	Inc. p.a.	2015 (Est)
Moranbah	6,507	3.1%	7,567	4.0%	9,202	2.2%	10,020
Clermont Town	1,919	-0.9%	1,838	4.0%	2,237	2.3%	2,450
Clermont Rural	1,351	0.3%	1,374	3.3%	1,619	0.4%	1,646
Ilbilbie	265	4.7%	334	-0.7%	323	-0.7%	315
Carmilla	330	0.2%	334	4.2%	411	-0.1%	409
St Lawrence	357	-0.2%	354	2.8%	406	-0.8%	393
Nebo	202	7.4%	288	10.2%	467	-0.7%	454
Glenden	890	5.0%	1,137	3.4%	1,342	1.6%	1,432
Middlemount	2,094	1.2%	2,221	-2.5%	1,955	1.5%	2,077
Dysart	2,877	3.7%	3,447	-0.2%	3,415	-0.8%	3,290
Nebo Rural	1,378	1.4%	1,478	4.1%	1,811	-0.7%	1,783
Total Isaac Region	**18,169**	**2.3%**	**20,372**	**2.6%**	**23,188**	**1.1%**	**24,269**

Source: ABS, Norling Consulting Estimates

Moranbah has the largest population of the eleven sub-regions, with this area comprising 41% of the total Isaac population in 2015. Strong growth was evident in the 2001 – 2011 period, although growth has softened from 2011.

The mining towns of Dysart, Middlemount, Glenden, Nebo and to a lesser extent Clermont have experienced fluctuating growth rates corresponding with the operations of mines being serviced by each town.

The coastal communities of Ilbilbie, Carmilla and St Lawrence each have small populations at and below 400 persons. There has been limited growth in these areas since 2001.

4.2. Population Scenarios

Following discussions with Council staff, Norling Consulting has prepared population projections based upon four different scenarios. There are of course other factors influencing population growth, such as those discussed in the previous Chapter, which may lead to a different outcome.

The assumptions for each scenario are detailed below. It is noted that the population for 2001, 2006 and 2011 are based upon the ABS Censuses and so these figures remain the same for all scenarios. The 2015 and 2016 estimates are based upon the ABS's 2015 ERP estimate. Therefore the 2015 and 2016 estimates also remain the same for all scenarios. We recommend that the 2015 and 2016 estimates be revised following the release of data from the 2016 Census.

Scenario 1 – Projections are based upon the Queensland Government Statistician's Office (QGSO) medium series projections, as adjusted by the more recent 2015 ERP estimates for the Region.

Scenario 2 – Projections assume an increase in the proportion of FIFO and DIDO and the corresponding consequence of using fewer resident workers. Table 4.2 details the total non-resident worker projections for this Scenario revealing the gradual increase in non-resident workers from 2016 - 2036.

Scenario 3 – Projections are based on the assumption that carbon capture storage technologies are unviable and thermal coal production ceases by 2031. Levels of FIFO and DIDO remain unchanged. The number of non-resident workers are projected to decline post 2026 as the production of thermal coal reduces.

Scenario 4 – Projections assume that carbon capture storage technologies are viable ensuring the ongoing future operation of thermal coal production. Levels of FIFO and DIDO

remain unchanged. The number of resident and non-resident workers are assumed to both increase under this Scenario.

It is noted that none of the assumption include assumptions relating to the advancements of technology including increased mechanisation and the impact this may have on labour, workforce and regional population.

As discussed under the scenarios, the quantum of non-resident workers in the Region will influence the resident population. QGSO has prepared four projection series to 2022 (Series A, B, C and D) for non-resident workers, revealing the high degree of uncertainty involved in such projections. All four series project the region's non-resident population to decline to 9,730 persons in 2016 due to workforce reductions and mine closures. Series A anticipates that the number of non-resident workers will remain relatively stable to 2022. Series B, C and D projections foresee overall growth in the non-resident workforce. Series B takes into account five coal projects (including Carmichael Coal and Red Hill), three rail projects, and the Galilee Basin Transmission Project, which have all been approved but yet to reach FID. Series C projection takes into account all Series B projects, along with the influence of two additional coal projects that have published an EIS but are yet to receive an approval. The Series D projection includes a further three coal projects in early planning. It is noted that none of the projection series include consideration of the Arrow Bowen Pipeline or Bowen Gas Project.

As such, the QGSO non-resident worker projections have been analysed and Norling Consulting has adopted a 2021 position as between Series B and C.

Projections of non-resident workers are detailed for each Scenario in the Table below:

TABLE 4.2: Non-Resident Worker* Projections for Isaac Region

	2011	2016	2021	2026	2031	2036
Scenario 1	13,590	9,730	14,500	13,000	12,000	11,000
Scenario 2	13,590	9,730	14,650	15,150	16,100	17,500
Scenario 3	13,590	9,730	14,500	13,500	10,500	6,500
Scenario 4	13,590	9,730	14,500	13,000	14,500	17,400

**Non-resident workers on-shift*
Source: QGSO projections and Norling Consulting

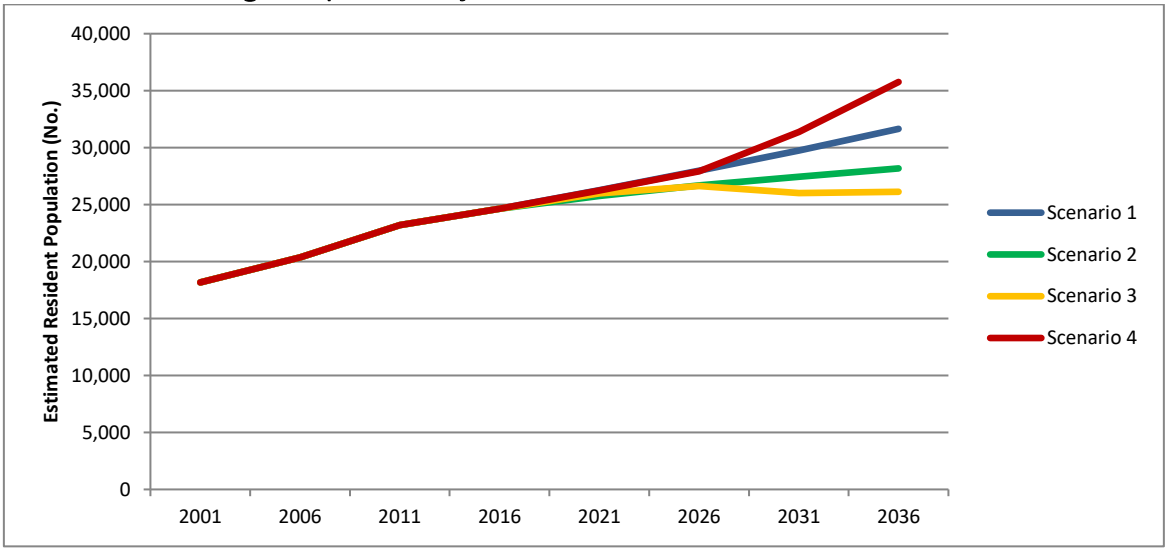
Table 4.3 sets out the totals of each population scenario for the Isaac Region. The data is illustrated in Figure 3.2 below.

TABLE 4.3: Isaac Region Population Projections for the Four Scenarios 2016 - 2036

	2016	Inc. p.a.	2021	Inc. p.a.	2026	Inc. p.a.	2031	Inc. p.a.	2036
Scenario 1	24,620	1.3%	26,266	1.3%	27,964	1.3%	29,758	1.2%	31,646
Scenario 2	24,620	0.9%	25,763	0.7%	26,681	0.6%	27,432	0.5%	28,175
Scenario 3	24,620	1.1%	25,975	0.5%	26,628	-0.5%	26,017	0.1%	26,131
Scenario 4	24,620	1.3%	26,242	1.2%	27,924	2.4%	31,387	2.6%	35,762

Source: ABS, QGSO Population Projections, Norling Consulting

FIGURE 4.3: Isaac Region Population Projections for the Four Scenarios



Source: ABS, QGSO Population Projections, Norling Consulting

Scenario 4 (carbon capture technologies viable) results in the greatest population in 2036 due to the continued production of thermal coal. Such technologies are not expected to become viable or commercially available until at least another decade, so stronger levels of growth are projected to occur post 2026. A population of 35,800 is projected by June 2036.

Under Scenario 1, the Isaac Region is estimated to reach a population of 31,650 by 2036. Steady growth rates in the order of 1.3% are projected to occur from 2016 to 2036 in accordance with the medium series QGSO population projections.

Scenario 2, based upon the assumption that mines will increase their proportion of FIFO/DIDO workers, results in a 2036 population of 28,200. Growth rates of below 1% are expected with this Scenario beyond 2016.

Scenario 3 is projected to result in the lowest 2036 population estimate of all scenarios. Based on this Scenario, the Region is projected to reach a population of 26,100. The effects of the reduced demand for thermal coal is likely to be evident from 2021 with growth rates decreasing from this time onwards.

The following details the population projections for the smaller sub-regions for each scenario.

Scenario 1

TABLE 4.4: Population Projections Scenario 1

	2016	inc. p.a.	2021	inc. p.a.	2026	inc. p.a.	2031	Inc. p.a.	2036
Moranbah	10,303	2.0%	11,360	1.8%	12,410	1.7%	13,480	1.7%	14,630
Clermont Town	2,458	0.9%	2,565	0.9%	2,681	1.0%	2,817	0.9%	2,950
Clermont Rural	1,652	0.6%	1,706	0.8%	1,773	1.2%	1,885	1.3%	2,011
Ilbilbie	319	0.0%	319	1.0%	335	1.0%	352	1.0%	369
Carmilla	411	0.7%	425	1.0%	446	1.0%	469	1.0%	492
St Lawrence	388	0.4%	395	0.7%	409	0.7%	422	0.2%	426
Nebo	469	2.1%	521	1.8%	569	1.8%	621	1.7%	677
Glenden	1,459	1.8%	1,594	1.8%	1,740	1.8%	1,899	1.3%	2,031
Middlemount	2,091	0.5%	2,142	0.1%	2,149	-0.2%	2,126	-0.2%	2,104
Dysart	3,305	0.8%	3,433	0.7%	3,558	0.7%	3,693	0.9%	3,864
Nebo Rural	1,768	0.4%	1,807	1.0%	1,896	1.0%	1,993	1.0%	2,092
Total Isaac Region	**24,622**	**1.3%**	**26,266**	**1.3%**	**27,964**	**1.3%**	**29,758**	**1.2%**	**31,646**

Source: ABS, QGSO Population Projections, Norling Consulting

Under Scenario 1, the largest centre of the Region, Moranbah, is projected to grow at modest rates of 1.7 – 2.0% between 2016 and 2036 to reach a population of 14,630 by 2036. The coastal areas of Ilbilbie, Carmilla and St Lawrence as well as the rural areas are expected to experience slow continued growth to 2036. The mining towns of Nebo and Glenden are projected to grow at modest growth rates at an average of around 1.8% per annum. Dysart, the largest of the mining towns (outside of Moranbah) is projected to grow by 560 persons between 2016 and 2036, representing an average annual growth rate of 0.8%. Very little growth is projected to occur at Middlemount during the twenty year projection period.

Scenario 2

TABLE 4.5: Population Projections Scenario 2

	2016	Inc. p.a.	2021	Inc. p.a.	2026	Inc.p.a.	2031	Inc.p.a.	2036
Moranbah	10,303	1.2%	10,951	0.9%	11,435	0.6%	11,761	0.5%	12,077
Clermont Town	2,458	0.9%	2,565	0.9%	2,681	0.8%	2,793	0.8%	2,902
Clermont Rural	1,652	0.6%	1,706	0.8%	1,773	1.2%	1,885	1.3%	2,011
Ilbilbie	319	0.0%	319	1.0%	335	1.0%	352	1.0%	369
Carmilla	411	0.7%	425	1.0%	446	1.0%	469	1.0%	492
St Lawrence	388	0.4%	395	0.7%	409	0.7%	422	0.2%	426
Nebo	469	1.9%	515	0.8%	536	0.7%	556	0.7%	576
Glenden	1,459	0.9%	1,526	0.3%	1,546	0.3%	1,566	0.2%	1,586
Middlemount	2,091	0.5%	2,142	0.1%	2,149	-0.2%	2,126	-0.2%	2,104
Dysart	3,305	0.6%	3,413	0.4%	3,476	0.2%	3,508	0.2%	3,540
Nebo Rural	1,768	0.4%	1,807	1.0%	1,896	1.0%	1,993	1.0%	2,092
Total Isaac Region	**24,622**	0.9%	**25,763**	0.7%	**26,681**	0.6%	**27,432**	0.5%	**28,175**

Source: ABS, QGSO Population Projections, Norling Consulting

Under Scenario 2, it has been assumed that all the mining towns of Moranbah, Dysart, Middlemount, Glenden, Nebo and Clermont will be affected by an increase to the proportion of FIFO and DIDO workers. It is projected that the number of non-resident workers would increase to 14,650 by 2021, 15,150 by 2026, 16,100 by 2031 and 17,500 by 2036.

Projected population estimates will decline along with the loss of jobs for residents, reducing the total Isaac population by 3,400 persons by 2036 in comparison to Scenario 1. Moranbah is projected to be most affected, with the town reaching a population of 12,077 by 2036 under this Scenario, 2,550 persons less than under Scenario 1. The other mining towns are projected to also reduce in population in comparison to Scenario 1 with Glenden having 445 fewer residents, Dysart with 325 fewer, Nebo with 101 fewer and Clermont town being least affected with 48 fewer residents.

Scenario 3

TABLE 4.6: Population Projections Scenario 3

	2016	Inc. p.a.	2021	Inc. p.a.	2026	Inc.p.a.	2031	Inc.p.a.	2036
Moranbah	10,303	1.6%	11,176	1.2%	11,881	0.8%	12,349	0.7%	12,805
Clermont Town	2,458	0.9%	2,565	0.7%	2,656	0.5%	2,721	0.5%	2,782
Clermont Rural	1,652	0.6%	1,706	0.8%	1,773	1.2%	1,885	1.3%	2,011
Ilbilbie	319	0.0%	319	1.0%	335	1.0%	352	1.0%	369
Carmilla	411	0.7%	425	1.0%	446	1.0%	469	1.0%	492
St Lawrence	388	0.3%	393	0.8%	409	0.7%	422	0.2%	426
Nebo	469	1.9%	515	-2.7%	449	-14.9%	201	-10.7%	114
Glenden	1,459	1.3%	1,556	-1.1%	1,470	-8.7%	932	-3.6%	776
Middlemount	2,091	0.9%	2,186	-0.9%	2,091	-3.1%	1,785	-4.0%	1,455
Dysart	3,305	0.1%	3,327	-0.6%	3,222	-2.0%	2,909	-0.7%	2,808
Nebo Rural	1,768	0.4%	1,807	1.0%	1,896	1.0%	1,993	1.0%	2,092
Total Isaac Region	24,622	1.1%	25,975	0.5%	26,628	-0.5%	26,017	0.1%	26,131

Source: ABS, QGSO Population Projections, Norling Consulting

Without viable carbon capture technologies, the future of thermal coal mining is uncertain. Under this Scenario the non-resident workforce is projected to decline to 13,500 by 2026, 10,500 by 2031 and 6,500 by 2036. While all mining towns are likely to be somewhat affected, the towns primarily servicing thermal coal mines like Glenden and Nebo would be most affected. These towns are projected to halve in size, at least. Moranbah would be the most resilient of the mining towns given the large proportion of coking coal that surrounds this town. However, a reduction of 1,800 compared to Scenario 1 is projected for the town. Overall, the 2036 population of the Region would be 5,500 persons less than the Scenario 1 estimate, representing a significant decline of 17%.

Scenario 4

Table 4.7: Population Projections Scenario 4

	2016	Inc. p.a.	2021	Inc. p.a.	2026	Inc.p.a.	2031	Inc.p.a.	2036
Moranbah	10,303	2.0%	11,356	1.8%	12,401	1.8%	13,525	2.2%	15,104
Clermont Town	2,458	0.9%	2,565	0.9%	2,681	2.8%	3,071	3.5%	3,655
Clermont Rural	1,652	0.6%	1,706	0.8%	1,773	1.2%	1,885	1.3%	2,011
Ilbilbie	319	0.0%	319	1.0%	335	1.0%	352	1.0%	369
Carmilla	411	0.7%	425	1.0%	446	1.0%	469	1.0%	492
St Lawrence	388	0.3%	393	0.8%	409	0.7%	422	0.2%	426
Nebo	469	1.9%	515	1.7%	561	11.9%	985	8.8%	1,499
Glenden	1,459	1.7%	1,587	1.7%	1,728	5.4%	2,246	5.5%	2,936
Middlemount	2,091	0.5%	2,142	0.1%	2,149	4.3%	2,652	1.6%	2,865
Dysart	3,305	0.7%	3,427	0.7%	3,546	1.3%	3,787	2.6%	4,313
Nebo Rural	1,768	0.4%	1,807	1.0%	1,896	1.0%	1,993	1.0%	2,092
Total Isaac Region	**24,622**	1.3%	**26,242**	1.2%	**27,924**	2.4%	**31,387**	2.6%	**35,762**

Source: ABS, Norling Consulting Estimates

If carbon capture technologies prove to be successful at an economic level, the Region is projected to experience stronger rates of growth within the mining towns than all other Scenarios. Under this Scenario, a 2036 population of 35,760 is projected, which represents 4,100 more persons than under Scenario 1 or an increase of 13%. While the rural and coastal townships are expected to grow at the same rate as under Scenario 1, additional growth is expected within Moranbah, Nebo, Glenden and Middlemount and to a lesser extent Dysart and Clermont Town.

5. CONCLUSION

The Isaac Region and its reliance on the resource sector means the Region is export dependent and vulnerable to the volatility of global issues. The future population growth of the Region will be highly dependent upon the mining industry and any changes that occur within this industry, including changes in the proportion of FIFO/DIDO workers, introduction of carbon capture schemes and the future of thermal coal. Global coal prices, fluctuating demand, international investment and changing labour costs will also influence the future of coal mining within the Region.

This Study has explored four different population scenarios based on different assumptions relating to the mining industry. Projections for the number of non-resident workers in the Region have also been undertaken for each Scenario. Scenario 1 is based on the medium series QGSO projections. Scenario 2 is based upon an increase in the proportion of FIFO and DIDO workers. Scenario 3 assumes that carbon capture technologies will not be available/viable resulting in the cessation of thermal coal production by 2031. Scenario 4 is based on the assumption that carbon capture technologies will be available and economic in the next decade ensuring the ongoing production of thermal coal.

Scenario 4 results in the greatest population in 2036 due to the continued production of thermal coal. Such technologies are not expected to become viable or commercially available until at least another decade, so stronger levels of growth are projected to occur post 2026. A population of 35,800 is projected by June 2036.

Under Scenario 1, the Isaac Region is estimated to reach a population of 31,650 by 2036. Steady growth rates in the order of 1.3% are projected to occur from 2016 to 2036 in accordance with the medium series QGSO population projections.

Scenario 2, based upon the assumption that mines will increase their proportion of FIFO/DIDO workers, results in a 2036 population of 28,200. Growth rates of below 1% are expected with this Scenario.

Scenario 3 is projected to result in the lowest 2036 population estimate of all scenarios. Based on this Scenario, the Region is projected to reach a population of 26,100. The effects of the reduced demand for thermal coal is likely to be evident from 2021 with growth rates decreasing from this time onwards.

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