Pilbara Industry's Community Council

April 2010

Planning for resources growth in the Pilbara: revised employment & population projections to 2020

Report prepared for Pilbara Industry's Community Council

by Mike Waller, Director, Heuris Partners Ltd

Table of Contents

Summary of findings 3

1. Context & Purpose of this Report 5
2. Data sources and critical drivers and issues 6
3. Employment projections – operations 7
4. Construction cycles – employment impacts 9
5. Population projections - the Pilbara as a whole 10
6. Population projections – how township numbers might change 10
7. The combined picture – regional perspectives on service pressures 11
8. Implications of resident population projections for Pilbara selected service provision . 15

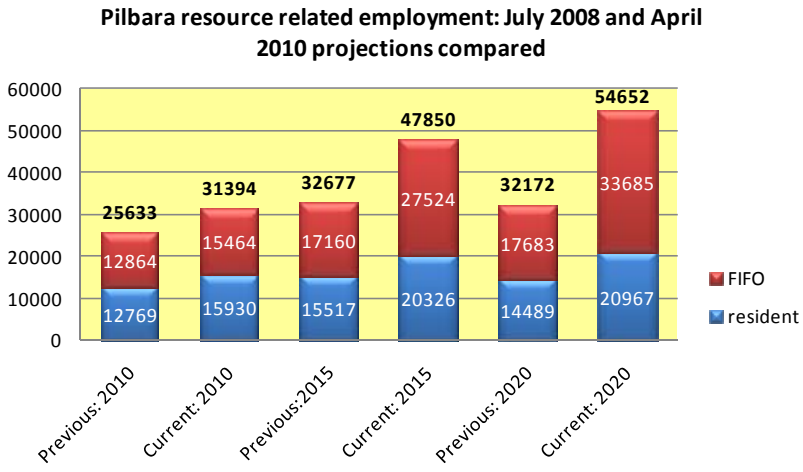
Annex 1: Project data input/assumptions 17

Annex 2: Regional perspectives in more detail 18

Summary of findings

This report updates resource related employment and population projections completed in July 2008, coinciding with the onset of the global financial crisis. The projections are generated from what is now a broader range of company inputs on expansion plans, again supplemented by public data sources for non-PICC member projects. The results from the current analysis suggest that companies operating in the Pilbara are emerging from the impacts of the crisis with stronger investment and production intentions than underpinned the July 2008 projections (Figure ES1).

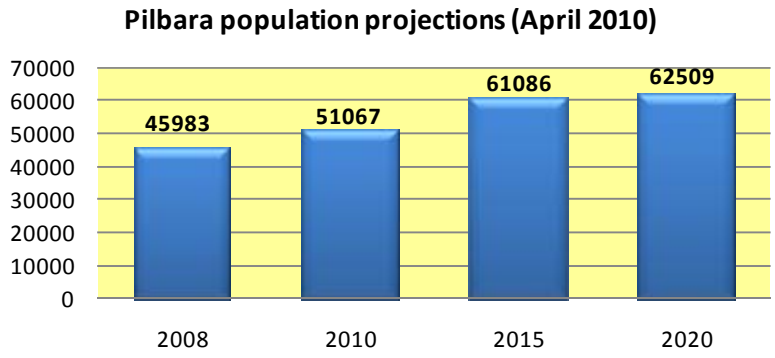
Figure ES1



The strongest projected employment growth is in FIFO: current projections in 2015 and 2020 are some 10,300 and 16,000 higher than the July 2008 projections.

The projected changes in resident workforce produce Pilbara population projections that are also above those generated in July 2008 (ES2). The projections are meant as a proxy for the ABS Estimated Resident Population (ERP) count. They are some 5,400 and 10,600 respectively above the previous projections for 2010 and 2015.

Figure ES2



The total population picture & implications for pressures on local services

ERP numbers do not provide the full story on the likely number of people working in the Pilbara who draw to some degree on local services of key population centres. These service demands are primarily a function of the peoples' geographical locations (described by the ABS as a "service

population" [1]), rather than workforce status. Hence some FIFO and construction workers may draw on township/shire services because they are located in or sufficiently close to population centres to access a range of services.

In this survey we have therefore sought to understand the likely location of FIFO and construction workforces, drawing on input from individual companies and from local government sources. Figure ES3 provides an overview by Local Government area of the combined totals of the projected ERP, FIFO and construction employment for the period 2010-2015. On the basis of current projected investments and activity, these show the total Pilbara population reaching 100,000+ by 2012 and remaining at or near that level through to 2015. This compares to the July 2008 estimated peak of some 75,000.

Figure ES3

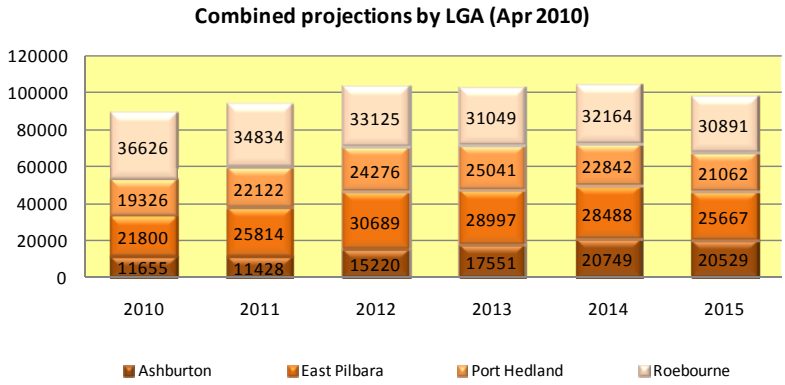
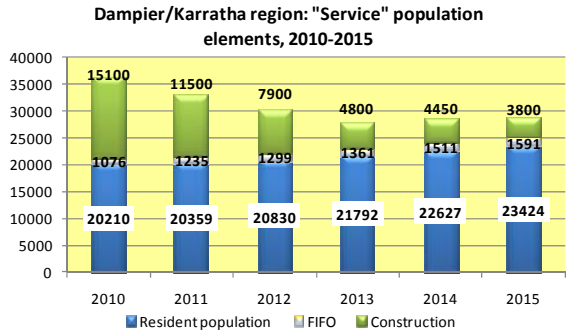


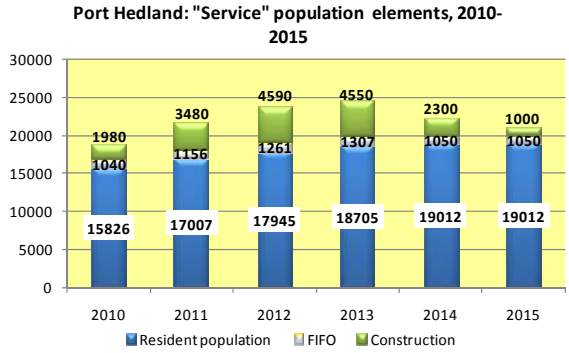
Figure ES4 provides a breakdown of the "service" population elements for the two largest population "nodes" in the Pilbara –Dampier/Karratha/Burrup/Roebourne and Port Hedland. These projections indicate FIFO/construction workers can inflate ERP numbers by 20-40% at peak activity periods, implying much greater pressures on critical service provision in the Pilbara than ERP numbers alone would suggest.

This points to the need for a more detailed examination of the implications for governments and companies of this very strong outlook for resource related activities covering all service population elements, for example by regular physical headcounts in key population nodes.

Figure ES4: "Service" population estimates, Dampier/Karratha/Burrup & Port Hedland

[1] The ABS define a 'Service population' to refer to all persons who access services and facilities generally provided by a locale (e.g. a Local Government Area), whether permanent or temporary residents of the area from which the service is sought. (see ABS Demography Working Paper 99/3: Service Population Pilot Study, October 1999)





1. Context & Purpose of this Report

As part of the Pilbara Industry's Community Council (PICC) joint planning for the growth in the output of the resources sector in the Pilbara over the period 2015-20, in 2008 PICC commissioned Heuris Partners to compile a bottom up picture of major planned and potential resource projects and model the resulting direct and multiplier impacts on Pilbara employment and population growth out to 2020. The results of this analysis were presented to PICC in a paper dated July 2008.[2] The paper reported the model results in aggregate and for sub-regions and townships in the Pilbara, using a range of employment measures to reflect the potential locus and timing of service demands out to 2015-2020. In addition, a number of measures were brought together at a regional and local government area level to provide a proximate indicator of possible pressures on service provision.

The resulting population projections were shared with the WA Government. In November 2008, the WA Planning Commission (WAPC) announced that the population and employment figures prepared by PICC would be used by the WAPC and others for forward planning in the region in recognition of the special circumstances in the Pilbara, with its large proportion of fly-in fly-out workers, and the need for large construction workforce for the region's major infrastructure projects.[3]

Completion of the PICC work coincided with the onset of the global financial crisis. World economic growth prospects were sharply recalibrated as a result of the crisis and uncertainties about the effectiveness of governmental responses to it. The initial reaction in the resources sector was the cancellation/delay of a number of planned investments, both in the Pilbara and globally. More recently, however, growing recognition of the buoyant economic growth in China has seen a return of strong interest in new or expanded energy and minerals projects in the Pilbara.

The purpose of this report is to review and update the July 2008 in the light of the current resource investment outlook in the Pilbara.

---

[2] "Planning for resources growth in the Pilbara: employment & population projections to 2020": Report prepared for Pilbara Industry's Community Council by Mike Waller, Director, Heuris Partners Ltd. (July 2008)

[3] http://www.planning.wa.gov.au/WAPC+statements/1734.aspx

2. Data sources and critical drivers and issues

The operating and construction employment outcomes summarised here reflect the project roll out and production/workforce assumptions for the Pilbara resource projects. These assumptions are based on individual company data from PICC corporate members and a range of other companies, as well as publicly available information on other companies' investment plans (particularly the register of minerals and energy projects published by the Western Australian Departments of Mines and Petroleum and State Development which maintains a database of committed and prospective projects).[4]

The current analysis reflects input from ten companies, a substantial broadening of the individual company data on employment plans compared with the July 2008 report. Annex 1 lists the projects that have been included from essentially public sources, to complement commercially confidential information provided by individual companies, to compile operating and construction workforce numbers. The annex also shows the family formation and employment multipliers used in the current projections.[5]

The latest projections have also benefited from input from local government surveys of short stay accommodation used by resource companies, contractors etc to house operational and construction workers. Translating these accommodation numbers into workforce estimates has proved problematic in some cases because of the varying work practices across companies that generate significant differences in capacity utilisation of short stay accommodation.

As with the July 2008 report, iron ore projects remain the dominant driver of operating employment in the Pilbara. By contrast, oil and gas projects tend to be very capital intensive, employing relatively fewer operating staff but generating very high demands for construction workers.

Changed population/employment base for projections

The July 2008 projections used the ABS 2006 Census data for the Pilbara as a base to which were applied the incremental workforce changes uplifted by employment and family multipliers to derive population changes.

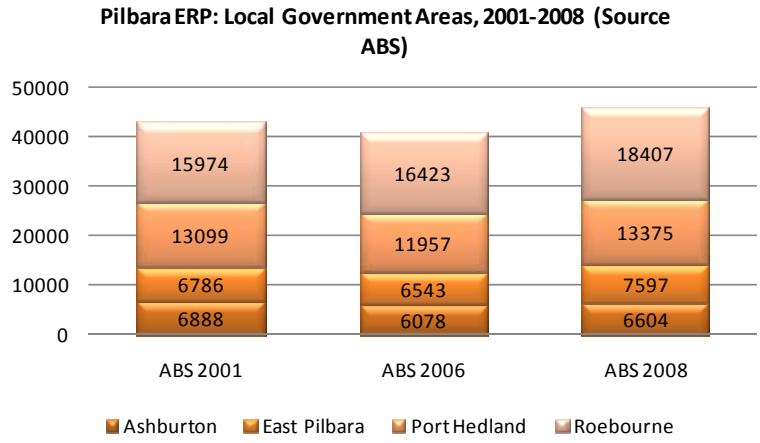
The projections in this paper have been shifted to a 2008 base year to reflect ABS updates of the Pilbara estimated resident population (ERP) and to accommodate the data input from PICC members. This generally only starts with 2008 employment data or later. The 2008 ABS ERP for the Pilbara is just under 46,000, an increase of 5,000 over the 2006 Census ERP of 41,000 and broadly equivalent to the Heuris July 2008 resident population projection for 2010.

This increase in the ABS ERP provides some confidence that the ABS intra-censual adjustment method (which predominantly relies on notified address changes via Medicare) is reflecting at least some of the impact of inward migration associated with resource investments in the Pilbara. It does, however, present a difficulty for updating projections for individual townships because the updates are only applied at a local government area level (Figure 1). As a result, the township breakdown presented in this report (Section 6) should be treated with some caution.

Figure 1

[4] Data in this report is based on Pilbara projects listed in the May 2010 edition of "Prospect" (see http://www.dmp.wa.gov.au/)

[5] Employment multipliers for mining projects without contractor estimates have been increased in line with recent work carried out for the Minerals Council of Australia (see "The Employment Effects In The Australian Minerals Industry from the Proposed Carbon Pollution Reduction Scheme In Australia", page 24: Concept Economics)



Continuing challenge of possible under counting for service provision in the Pilbara

As noted in the July 2008 report, ERP data need to be supplemented with other information that better reflects the likely level of demand for goods and services across the Pilbara with rapidly growing numbers of transient workers on different employment conditions, such as fly in-fly out (FIFO). Evidence from the Pilbara, for example, points to the large difference between ERP and the actual numbers of people using services (e.g. water, waste treatment, transport). This is a matter of major concern to those planning for service provision in key Pilbara population centres.[6]

Given the substantially higher employment and population numbers generated from the current survey, these challenges and concerns are likely to be exacerbated, arising from both:

- the projected increases in resident employees and their families; and
- the much higher FIFO numbers (for both construction and operational staff) at least some of which may draw on local services by virtue of their proximity to townships.

To provide some sense of the overall possible service pressures on key townships, we have sought to identify the location of FIFO and construction workforces, drawing on input from individual companies and from local government sources. This is presented in section 7 below. They serve to demonstrate significant additions to "resident" populations.

A granular understanding of these implications is beyond the scope of this work. But the updated employment and population projections presented in this paper would appear to warrant urgent separate analysis and joint work between companies and government service planners and providers.

Finally, it should be stressed that the further out the projections go the more uncertain is the evolution of projects and hence the potential employment impacts. The employment projections beyond 2015 should be treated as illustrative, with a greater degree of uncertainty around the likely outcomes as individual companies take differing approaches to the statistical treatment of expansion projects in the early phases of development. Accordingly, the population projection numbers based on these employment numbers should be treated as broad indications of trends, rather than accurate point forecasts.

3. Employment projections – operations

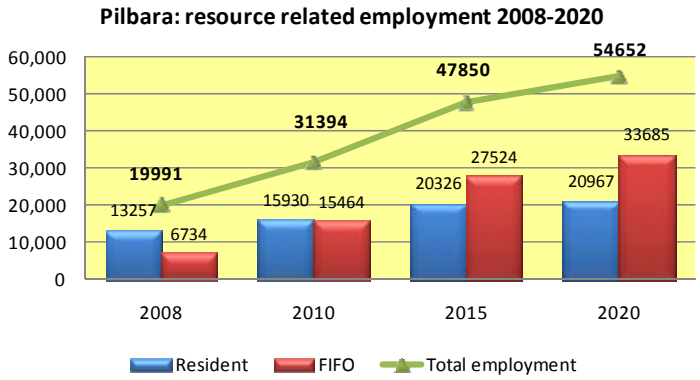
Based on information available as at March 2010, total resource related employment in the Pilbara is projected to grow from some 19,000 in 2008 to some 47,000 in 2015, reaching 53,000+ by 2020

[6] In presenting the high level results of the July 2008 to a number of stakeholders in Karratha, the author and the CMEWA representative were confronted with very strong claims that the Heuris population estimates were already well below actual numbers in the Karratha district, partly reflecting a focus on the ERP projections and the difficulties of attributing FIFO/construction numbers by location.

(Figure 2). These totals include local jobs required to support direct employment in the Pilbara and FIFO positions but exclude construction workforce numbers which are shown separately. Residential employment increases by 28% between 2010 and 2015, from 15,900 to some 20,300, with growth moderating thereafter[7].

FIFO projections grow at a faster rate, increasing by 83% between 2010 and 2015 and by a further 23% to 2020.

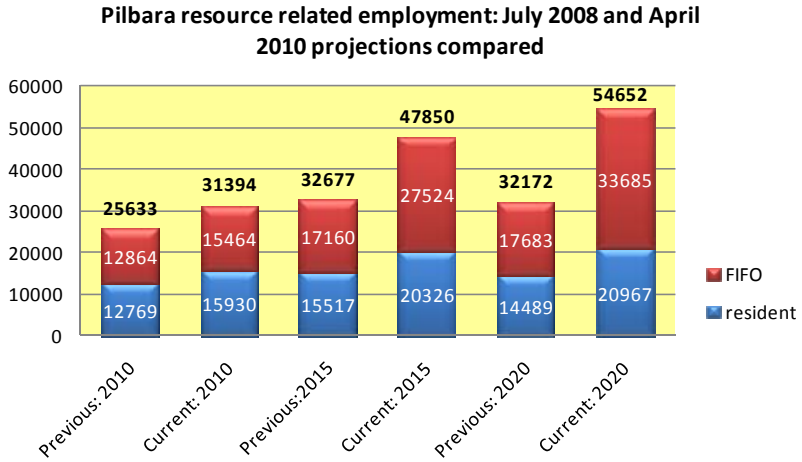
Figure 2



Change since July 2008 projections

The numbers emerging from the current inputs involve substantial increases over the July 2008 projections for 2015 and 2020, particularly for FIFO employment (Figures 3 and 4). This appears to reflect both new projects and re-evaluation of numbers required to deliver pre-existing expansion plans.

Figure 3



[7] This moderation may be partly explained by company estimates not including expansion plans for later in the projection period.

Figure 4

Changes between July 2008 and current projections (%)

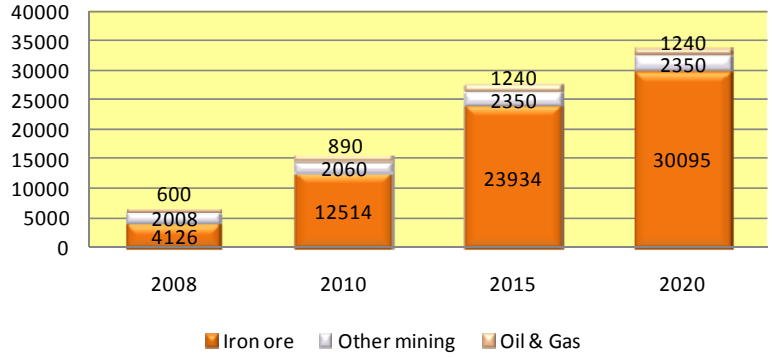
	2010	2015	2020
Resident	25%	31%	45%
FIFO	20%	60%	90%
Total employment	22%	46%	70%

FIFO – sectoral make up of operating workforce

As noted in Section 2, iron ore projects generate the largest requirement for operational staff. This is reflected in the FIFO numbers: by 2015 iron ore comprises some 90% of the FIFO positions in the Pilbara (Figure 5).

Figure 5

Pilbara FIFO employment projections (land based only)



4. Construction cycles – employment impacts

Projected construction activity generates construction employment reaching over 22,000 in 2010, peaking at some 28,000 in 2012 and dropping sharply away from 2015 onwards (Figure 6). This represents a more concentrated and intense pattern of employment than suggested by the July 2008 estimates (Figure 7). As noted earlier, these numbers are likely to be conservative because a number of companies have only chosen to include expansion/new projects at an advanced planning or approvals stage. Nearly all of these workers can be expected to be FIFO but, depending on their location, they may also create a range of pressures on infrastructure and services (see section 7).

Figure 6

Pilbara: April 2010 construction employment projections, 2008-2020

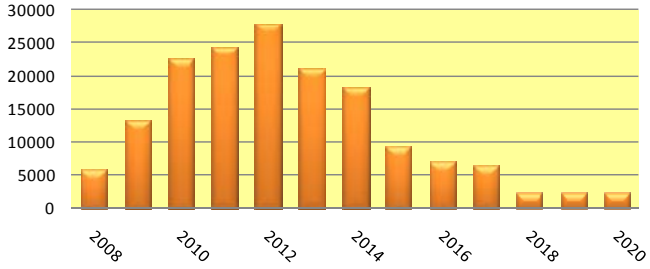
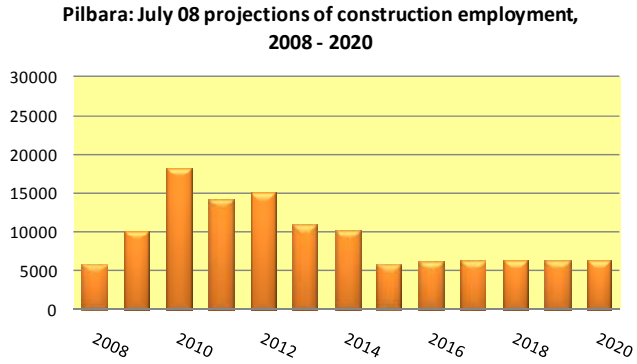


Figure 7



5. Population projections - the Pilbara as a whole

Applying the indirect employment and family multiplier assumptions to the projected resident employment numbers suggests the Pilbara's "resident" population could reach some 51,000 in 2010, and exceed 61,000 by 2015, rising to 62,500 by 2020 (Figure 8). This compares with the ABS ERP estimate for 2008 of some 46,000. This is an increase of 21% and 23% over the July 2008 population estimates for 2015 and 2020 respectively (Figure 9).

Figure 8

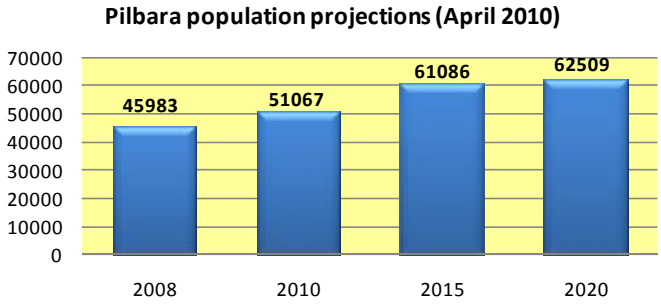
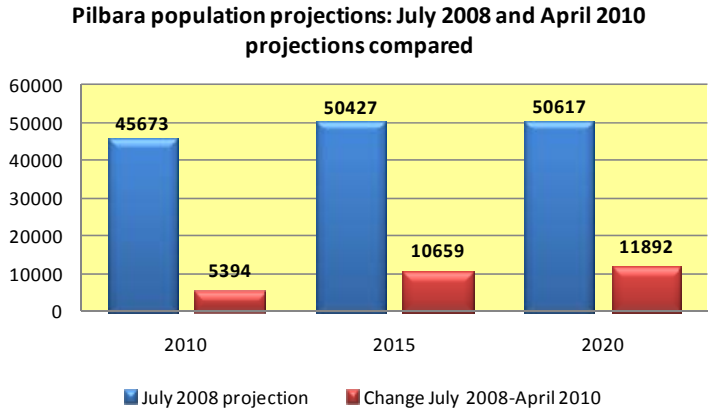


Figure 9



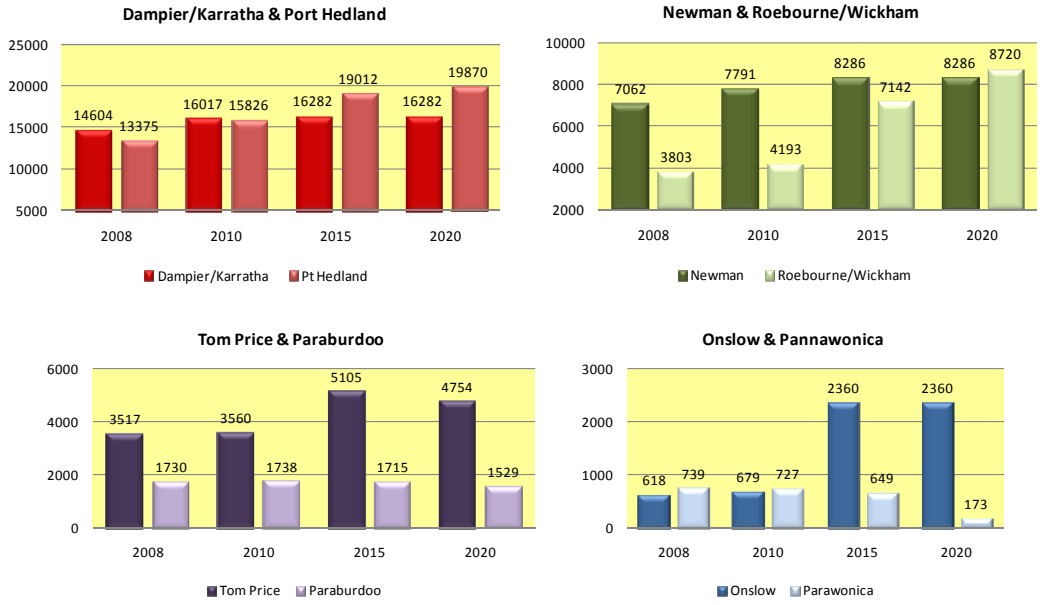
6. Population projections – how township numbers might change

Figure 10 shows projections of residential population changes for townships/areas where resource related developments are expected to have an impact. They reflect potential changes in permanent full time workforce numbers within a geographical location but employment data by township is not shown for confidentiality reasons. Areas have been aggregated where the location of employment is unclear.

The numbers should be regarded as illustrative and provisional estimates of possible changes in the ERP for the towns shown:

- The base 2008 ERP numbers for the towns have been estimated from the 2008 intra-censual update by pro-rating the 2006-2008 total ERP increase across the towns on the basis of their share of the total Pilbara count in 2006 (as noted above, the 2008 update has only been reported down to Local Government Areas).
- For smaller townships the numbers are particularly sensitive to assumptions about the timing and location of workforce changes and the balance of FIFO/residential employment.
- These numbers also do not reflect the possible total number of people drawing on town services driven, for example, by FIFO/construction employment located within township "catchment" areas (see section 7 below).

Figure 10: township population projections



7. The combined picture – regional perspectives on service pressures

As noted in Section 1, the different types of employment and resident patterns associated with transient and fast growing populations generate varied pressures on regional services and infrastructure which provide particular challenges for planners and service deliverers.

In order to assist in these tasks, this section draws together and presents the projections for the various categories of workforce and populations by key geographical subregions and local government area (LGA). Again, the purpose is to convey potential trends in the make-up of populations - the numbers should be treated with some caution since attribution across sub-regions etc involves a large element of judgment.

Set out below is a high level picture of the results. A more detailed breakdown is at Annex 2.

Total population elements by geography/administrative unit

Figure 11 shows combined estimates of the resident population, FIFO operating employment and construction staff for the Pilbara for six sub-regions: Dampier/Karratha/Burrup and other locations in Roebourne; Onslow; East Pilbara (excluding Newman); Pt Hedland and surrounds; Newman; and Ashburton, excluding Onslow (data underlying the graph for the years 2010-2020 are shown in Annex 2). Figure 12 presents the same data aggregated to Local Government Areas.

The latest projections suggest that the total population drawing on different levels and types of services across the region could rise to some 103,000 in 2012-2014, compared to the July 2008 estimated peak of some 75,000.

Figure 11

Combined resident, FIFO & construction projections by region: (April 2010)

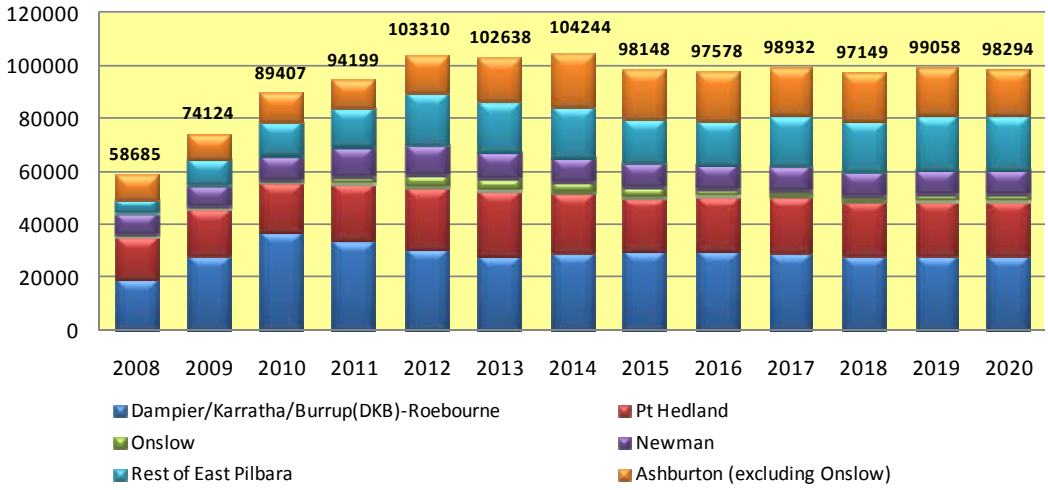
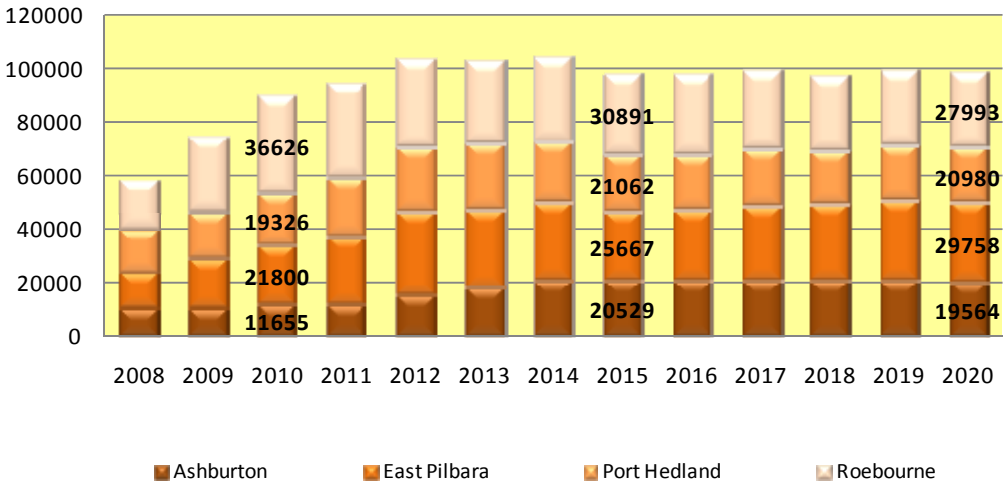


Figure 12

Combined projections by LGA (@ April 2010)



To illustrate the potential scale of the load on local services, Figures 13 and 14 provide a more detailed breakdown of the possible "service" population trends for the two largest population nodes in the Pilbara (Dampier/Karratha/Burrup/Roebourne and Port Hedland), focusing on the period 2010-2015[8]. Figure 13 shows the constituent elements of the service populations; Figure 14

[8] As noted earlier in the paper, the varying approaches to longer term workforce forecasting, and greater uncertainty about investment intentions, tends to impart a degree of conservative bias in the overall projections beyond 2015 (particularly in relation to construction numbers).

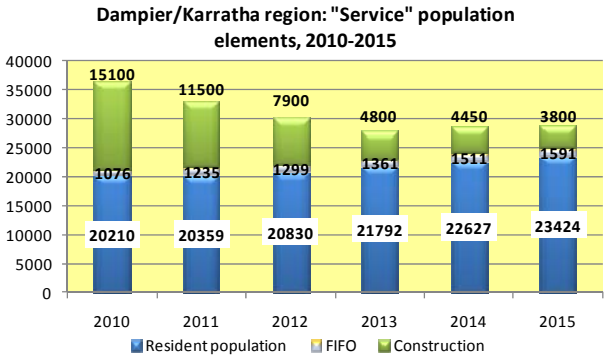
indicates the proportion of the total population accounted for by FIFO and construction workers (which would not normally be reflected in ABS ERP counts for these two population nodes) and for the Pilbara as a whole.

In summary:

- For Dampier/Karratha/Burrup, the total "service" population could be in excess of 36,000 in 2010, remaining at or above 30,000 through to 2015. The non-resident element of the population accounts for 44% of the total population in 2010, falling to 22% by 2015 as construction activity included in the projections falls away:
    - The projected fall off in construction employment is partially offset by higher levels of FIFO employment and residential population: the former increases by ~50% over the period and the latter by some 16%.
    - It is not clear from currently available information what proportion of the construction workforce will fly direct into construction sites and therefore have no/minimal impact on demand for local services.
- At Port Hedland, the total "service" population increases from ~19,000 in 2010 to some 25,000 in 2012/13, falling back to ~21,000 by the end of the period as currently projected construction employment drops from a peak of ~4,600 to 1,000 in 2015. Over the same period, however, the ERP increases from 15,800 to 19,000, an increase of 20%:
    - As with Dampier/Karratha, it is difficult to estimate what demands the non-resident population elements will place on local services. This will be determined by the geographical location of the accommodation. But a recent survey carried out by Port Hedland Council, suggests a significant proportion of the "non-resident" workforce will be accommodated within travelling distance of Port Hedland.

Figure 13

"Service" population estimates, Dampier/Karratha/Burrup & Port Hedland



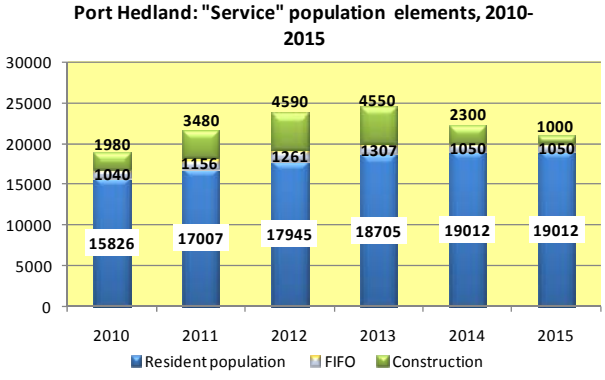
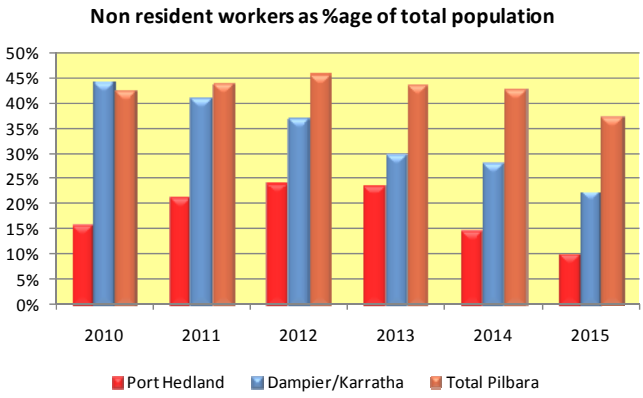


Figure 14

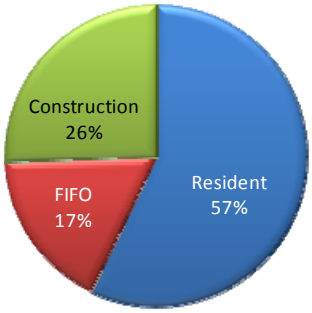


Changes in population elements over the projection period

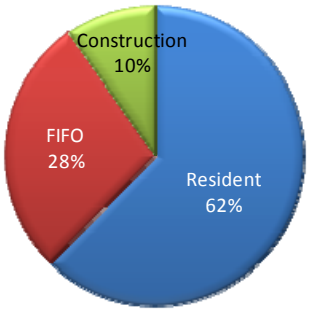
Figure 15 presents changes in the main constituent elements of the projections between 2010 and 2015/2020. The major reduction in construction numbers by 2015 primarily reflects the run down in committed/immediately prospective projects. A geographical breakdown of these elements is at Annex 2.

Figure 15

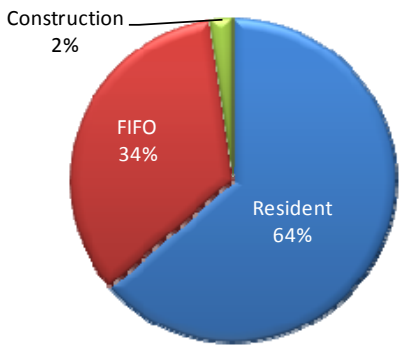
Pilbara "Population" Elements: 2010



Pilbara "Population" Elements: 2015



Pilbara "Population" Elements: 2020



8. Implications of resident population projections for Pilbara selected service provision

Sustaining the projected workforce and population scenarios would potentially require significant expansions in public services and associated infrastructure in the Pilbara.

As part of the July 2008 work, Heuris provided broad brush estimates of the potential staffing implications in the areas of education, health and policing of the resident population projections.[9] The estimates were based on publicly available data on 2005 "client" numbers (e.g. school students, resident population) that were then used to derive raw staffing ratios as a basis for calculating additional staffing demands in the Pilbara created by the projected population growth. This section updates these estimates in the light of the updated resident population projections.

Drawing on more recent data sets for compulsory education in the Pilbara[10], primary and secondary student and teacher numbers for the Pilbara in 2008 were as shown in Figure 16.

Figure 16: 2008 Pilbara primary & secondary education statistics

2008	Students	Teachers	Ratio
Ashburton	1099	108.1	10.2
E Pilbara	1205	100.6	12.0
Port Hedland	2050	162.1	12.6
Roebourne	2990	202.4	14.8
Total	**7344**	**573.2**	**12.8**
NB Excludes pre-school numbers			

.

On the assumption that the proportion of students generated by the projected population increases in this paper remains broadly the same (i.e. ~16% of the total Pilbara ERP for 2008), the projections imply a requirement for an additional 125 teaching staff in the Pilbara by 2015 over the 2008 reported numbers (Figure 17).

Figure 17: Projection implications for teacher requirements

[9] *Implications of population for Pilbara essential service provision Briefing note for PICC industry members* (Heuris Partners, August 2008)

[10] Education data for 2008 at http://www.regionalspotlights.com.au/Default.aspx?tabid=242

Changes from 2008 levels:	Population	Student numbers	Teacher requirement
at 2010	5084	812	63
at 2015	10019	1600	125
at 2020	1423	227	18
Total	**16526**	**2639**	**206**

Applying WA and/or Pilbara population/provider ratios for nurses and police to the population increases associated with the Heuris projections generates what seem to be significant additional demands in the Pilbara (Figure 18).

Figure 18: Projection implications for nursing and police levels[11]

Population ratio	Police: 1 to 396	Nurses: 1 to 93
Increased requirement to maintain current ratios:		
at 2010	13	55
at 2015	25	108
at 2020	4	15
Total by 2020	**42**	**178**

These figures are based on changes in the Pilbara resident population only. As noted earlier, depending on their geographical location, the substantial numbers of fly in-fly out operational and construction workers have the potential to place added pressure on health, policing and other community services. As a result, the numbers indicated here may understate the potential requirement for enhanced public services across the Pilbara.

[11] Police regional ratio sourced from WA Police Annual Report, 2008 (page 11); nursing ratio sourced from Australian Institute of Health & Welfare (nurse numbers in WA 2007/8) & ABS (WA population).

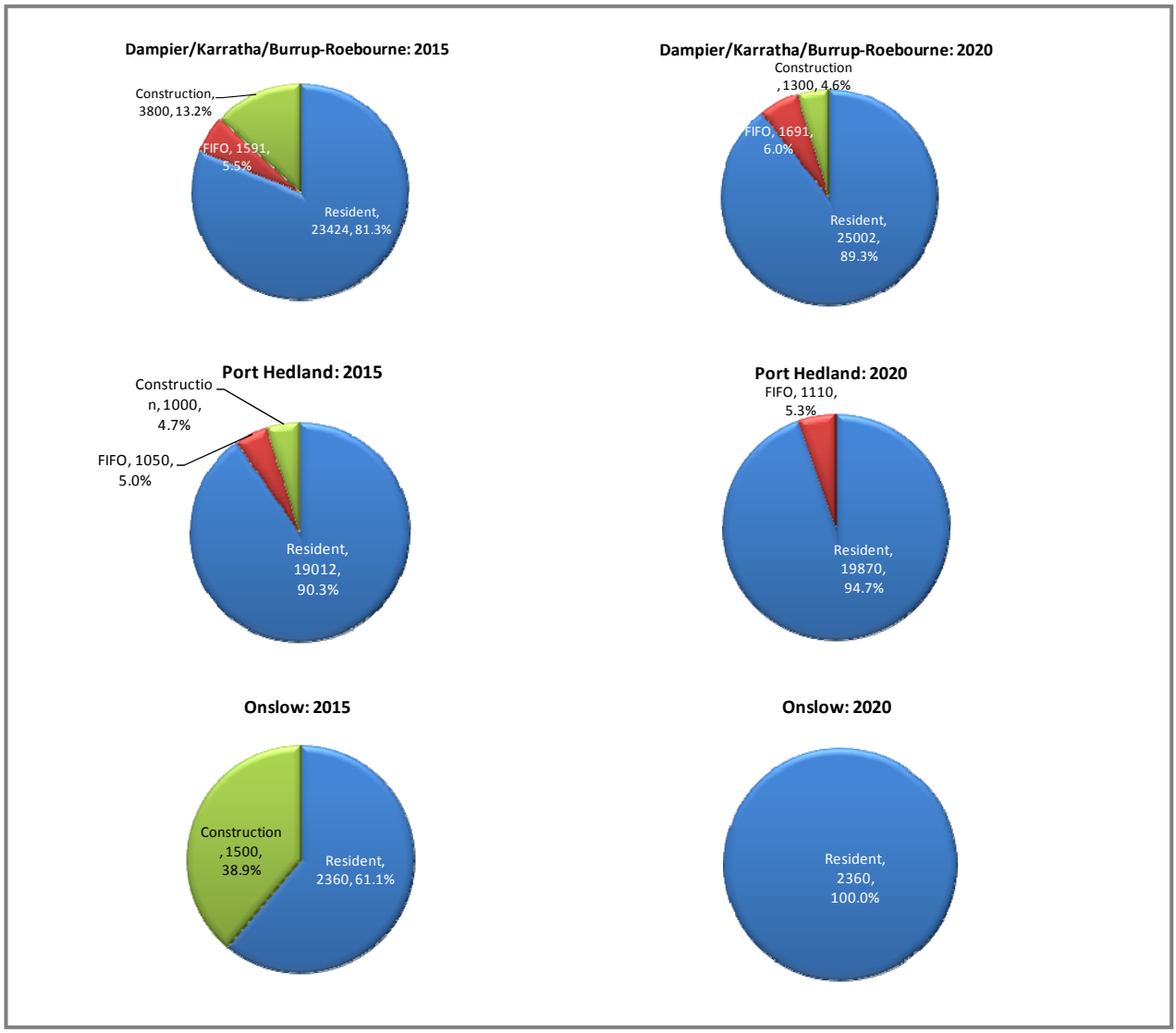
Annex 1: Project data input/assumptions

Projects data from public sources	Construction period	*Peak construction headcount*	Start operations	*Operating headcount*
Oil & Gas				
Burrup Fertilisers Ammonia Plant	2010-2012	600	2012	65
BHPB Onslow LNG onshore processing plant	2010-2012	300	2012	125
Devil Creek (Apache Energy)	2009-2011	200	2011	20
Iron Ore				
Hancock Roy Hill	2011-2013	3000	2013	1000
Australia Resources	2009-2011	2500	2011	800
MCC Mining	2011-2013	3000	2013	1000

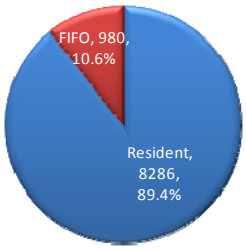
Multiplier assumptions	Value
Family multipliers	
Directly employed workforce	2.4
Contracted workforce	2
Resident construction workers	2
Indirect employment mutlipliers	
Mining companies who don't report contractor workers	1
Oil&gas companies who don't report contractor workers	0.75
Construction	0.2
Mining companies who report contractor workers	0.75

Annex 2: Regional perspectives in more detail

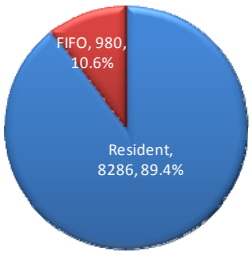
Combined resident, FIFO & construction projections by region											
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Dampier/Karratha/Burrup(DKB)-Roebourne	36626	33334	30125	28049	29164	29391	29977	29132	27986	27989	27993
Pt Hedland	19326	22122	24276	25041	22842	21062	21062	21521	20521	20980	20980
Onslow	864	2479	4366	4190	4190	3860	2360	2360	2360	2360	2360
Newman	9104	11041	11378	9915	9266	9266	9266	9266	9266	9266	9266
Rest of East Pilbara	12696	14773	19311	19082	19222	16400	16691	18656	18656	20569	20491
Ashburton (excluding Onslow)	10791	10450	13853	16361	19559	18168	18222	17996	18359	17893	17204
TOTAL "SERVICE POPULATION"	**89407**	**94199**	**103310**	**102638**	**104244**	**98148**	**97578**	**98932**	**97149**	**99058**	**98294**



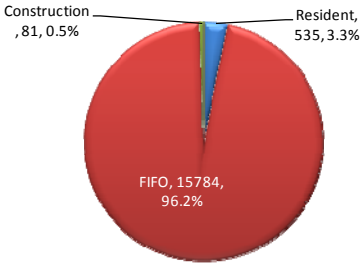
Newman: 2015



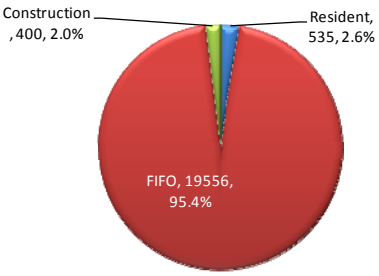
Newman: 2020



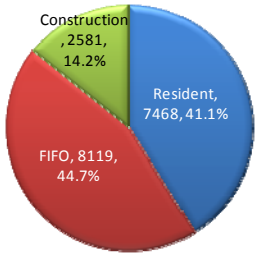
Rest of East Pilbara: 2015



Rest of East Pilbara: 2020



Ashburton (excl. Onslow): 2015



Ashburton (excl. Onslow): 2020