

Strategic Analysis Paper

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Expansion of Pilbara Ports to Power Region's Economy

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Summary

The ongoing strategic importance of the Pilbara region's ports is highlighted by announcements made throughout 2010 by major resource companies on the expansion and improvement of their export capacity. North West Australia's climatic conditions and sometimes extreme weather events, such as the annual incidence of tropical cyclones, provide elements of risk for the development and operation of projects in the region. This does not, however, prevent investment in offshore and onshore projects, as companies operate with stringent mitigation strategies for their staff and assets. Despite the region's geography, climate and severe weather events, the Pilbara continues to enjoy high levels of investment, expansion and economic growth. With this activity fuelled by the ongoing and increasing demand for minerals and energy, the Pilbara will remain pivotal to Australia's and Western Australia's economies.

Analysis

Importance of Pilbara Exports

The Pilbara's iron ore and Liquefied Natural Gas (LNG) are two of Western Australia's largest export earners. Yet, while the mineral and energy sectors provide many economic opportunities, the state government and industry are all too aware that the current capacity of the Pilbara ports limits future growth, especially for the iron ore and other mineral sectors.

In early 2010, the Western Australian Government unveiled plans to construct a new Pilbara deepwater port to meet ongoing and increasing demand for the region's iron ore. On 4 March 2010, Premier Colin Barnett announced that Anketell had been chosen 'as the next major deepwater iron ore port for the Pilbara'.

Located 30 kilometres east of Karratha and 10 kilometres from Cape Lambert, Anketell will complement the other Pilbara ports at Port Hedland and Dampier. Slated to be operational by 2015, this new deepwater port will have an export capacity in excess of 350 million tonnes per annum (Mtpa). It will include new transport corridors and an adjoining 1,400 hectare industrial precinct.

This decision has been driven largely by the need to increase the export capacity of the Pilbara ports and to capitalise on the ongoing demand from East Asian markets.

In 2008-09, bulk commodity exports from the Pilbara ports - predominantly iron ore - amounted to 326 Mtpa. That amount will continue to rise. By 2015, it is forecast to reach 530 Mtpa, and by 2020 750 Mtpa.

Iron ore is the most valuable resource sector in Western Australia. According to the Western Australian Department of Mines and Petroleum, the value of the state's iron ore industry grew in value by 53 percent during 2008-09 to \$33.56 billion and in volume by 8.5 percent to 316 million tonnes.¹

Iron ore currently accounts for 47 percent of the total value of Western Australia's resources. The state Government stated that, in 2008-09, China was the number one export destination for Western Australian iron ore (64 percent) followed by Japan (21 percent) and South Korea (10 percent). An additional three percent of the state's iron ore is exported to Taiwan. This means East Asia represents approximately 98 percent of Western Australia's iron ore export market.

The Players

The major iron producers based in the Pilbara region are BHP Billiton and Rio Tinto. In 2008-09, these two companies accounted for approximately 90 percent of Western Australia's iron ore production.

BHP Billiton is one of the acknowledged long-term iron ore 'majors' operating in the Pilbara, and employs 8,000 people in its Pilbara operations, or approximately 18 percent of the region's population. Its business operations include seven mines, a rail network of nearly 1,400 kilometres and two separate port facilities. These are located on opposite sides of Port Hedland's harbour, one on Finucane Island and the other, where its ship-loader is based, on Nelson Point. The iron ore shipment systems are designed to load four 160,000 tonne vessels at the same time.

Another Pilbara 'mining major' is Rio Tinto Iron Ore, which operates three shipping terminals at two ports in the Pilbara, exporting iron ore to markets in East Asia and Europe. One port is located at Cape Lambert some 40 kilometres north north-east of Karratha. The other is at Dampier on the Burrup Peninsula, with two shipping terminals: Point Parker and East Island Intercourse.

Rio Tinto Iron Ore announced on 24 September 2010 'Dampier Port expansion works that will result in an additional five million tonnes annual capacity (Mtpa), taking total Pilbara annual capacity to 230 Mtpa in Q1 2012.'

Only last month, on 21 October 2010, Rio Tinto Iron Ore announced that Robe River Iron Associates (53 per cent Rio Tinto) shipped its one billionth tonne of iron ore from the Pilbara.

Fortescue has emerged as the region's 'third player' in the export of iron ore. A US\$8.4 billion announcement by Fortescue on 19 November 2010 outlined a proposal to expand its Pilbara iron ore operations. This includes the expansion of its existing iron ore mining operations at Cloudbreak and Christmas Creek, located at the Chichester Hub, and opening up new mines at its Solomon Hub.

¹ Government of Western Australia, Department of Mines and Petroleum, 2009, *Mineral and Petroleum Statistics Digest 2008-09*.

'To achieve the expansion timetable, Fortescue will spend capital of US\$8.4bn over a planned 30 months, which at the peak of construction will equate to approximately US\$26m per day,' said FMG Development Director Peter Meurs.

A Fortescue company statement said that its company will lift its iron ore production from 55 Mtpa in 2009-10 to 155 Mtpa by 2013. The improvement and expansion of its port and rail facilities will be at a cost of US\$4.6 billion.

Fortescue currently has two berths and a single load-in and load-out circuit at the port. The Port Hedland Port Authority (PHPA) has given priority for the company to export 120 Mtpa. This recent announcement will see the construction two additional load-in and load-out circuits. PHPA has also provided capacity for Fortescue to construct two more berths, while the company has expressed its interest in securing a fifth berth. Upon completion of the expansion, it will have the capacity to export 155 Mtpa.

The rate of development of Fortescue's port capabilities has been impressive. Its open-access Herb Elliott Port at Point Anderson, Port Hedland, sits on a two million square metre site of reclaimed land. At this particular development the first earthworks commenced in February 2006 and by October 2009, the company had loaded 40 million tonnes of iron ore.

These developments round off a year in which the Pilbara attracted major investment decisions by government and the major iron ore companies. Much of the focus of these announcements has been on strategic infrastructure expansions, including transport corridors and hubs, such as the ports.

Port Hedland

In September 2010, World Port Development stated that Port Hedland 'is the second largest tonnage port in Australia, the largest iron ore port in the world and the largest bulk mineral exporting port in the world'. As a bulk commodity performer, Port Hedland is Australia's largest tonnage port, and second only to China's Port of Qinhuangdao.

According to strategic forecasts by the Town of Port Hedland in 2010, the port is on course to becoming 'the world's largest tonnage port on the back of the escalating production of iron ore'. The Town of Port Hedland also forecast that the PHPA will experience a growth rate of 600 percent over the long-term.

On 5 July 2010, PHPA chief executive officer Andre Bush announced that the port had broken its export tonnage record for a financial year. The expanding harbour had seen a throughput of 178.6 million tonnes during 2009-10, up by 20 million tonnes on the previous financial year.

'The full development of the inner harbour in the coming years could well see trade levels exceed 400MT a year. In the near term we are projecting total trade to exceed 200 million tonnes for the coming 2010-11 financial year and to be over 300 million tonnes for the following year 2011-12,' Andre Bush said.

With new iron ore discoveries still being made across the Pilbara, especially in East Pilbara, developers are able to take advantage of existing rail lines. Discussions continue regarding access to

rail lines owned by the major iron ore developers. An increase in the export of iron ore from this region will naturally increase the throughput at PHPA. Expansions are underway at the port to ensure that this growth can be accommodated.

Over the next decade, PHPA will undertake major expansion of its operations. 'Plans are progressing for the development of an additional 11 berths in the Inner Harbour over the next five years which should bring the total Inner Harbour throughput to around 470 Mtpa. Development plans for a 400 Mtpa Port Hedland Outer Harbour off Finucane Island to cater for proponent needs beyond 2014 are advancing,' Andre Bush said.

In October 2010, the Town of Port Hedland released a strategic document titled *Hedland's Future Today*. In it, the Town claims that, by 2018, it seeks to have 'co-location of naval defence facilities within the inner harbour, including a refuelling station'. Such forward planning means that this harbour will have port facilities that can accommodate both future commercial and defence requirements.

Dampier

The other major Pilbara port is Dampier, which is ranked third globally by World Port Development. Demand for iron ore (approximately 83.2 percent) and gas (approximately 15 percent for its LNG, liquefied petroleum gas and condensate) drove the bulk of the 2008-09 record annual tonnage of 140 Mtpa for the Dampier Port Authority (DPA).

The DPA states that the port, located just west of Karratha on the Burrup Peninsula, is 1,260 kilometres north of Perth. The port is a vital link in a logistics network that extends 350 kilometres inland to the iron ore mines and 200 kilometres seaward to the oil and gas fields of the North West Shelf.

The DPA's 2010 Annual Report outlines the port's capabilities, which include the operation of 'the Dampier Cargo Wharf (DCW) and the Dampier Bulk Liquids Berth. The DCW provides up to seven berths, and supplies water and fuel to the vessels servicing the marine industry, offshore oil and gas facilities. The DPA's facilities consist of the wharf, a heavy load-out facility, an alternate load-out facility and a barge ramp.' The demand for the latter facility over the last year 'has increased significantly' and 'further berth capacity is currently under design'.

In the year ending 30 June 2010, Dampier port entered a tonnage record 170.7 Mtpa and a record 4657 vessel arrivals. Looking at the future prospects for Dampier's port, DPA Chairman Brendan Hammond said that 'in particular, the Board has confirmed the importance and benefit of expanding the boundaries of the port's expertise and experience, to take account of proposed port developments near Onslow (Ashburton North) and Point Samson (Anketell Port/SIA)'.

Cyclones and their impacts

An ongoing influence in this region is its climatic patterns and extreme weather conditions. One defining element is the presence of tropical cyclones that form offshore and regularly, cross the Pilbara coastline in the cyclone season.

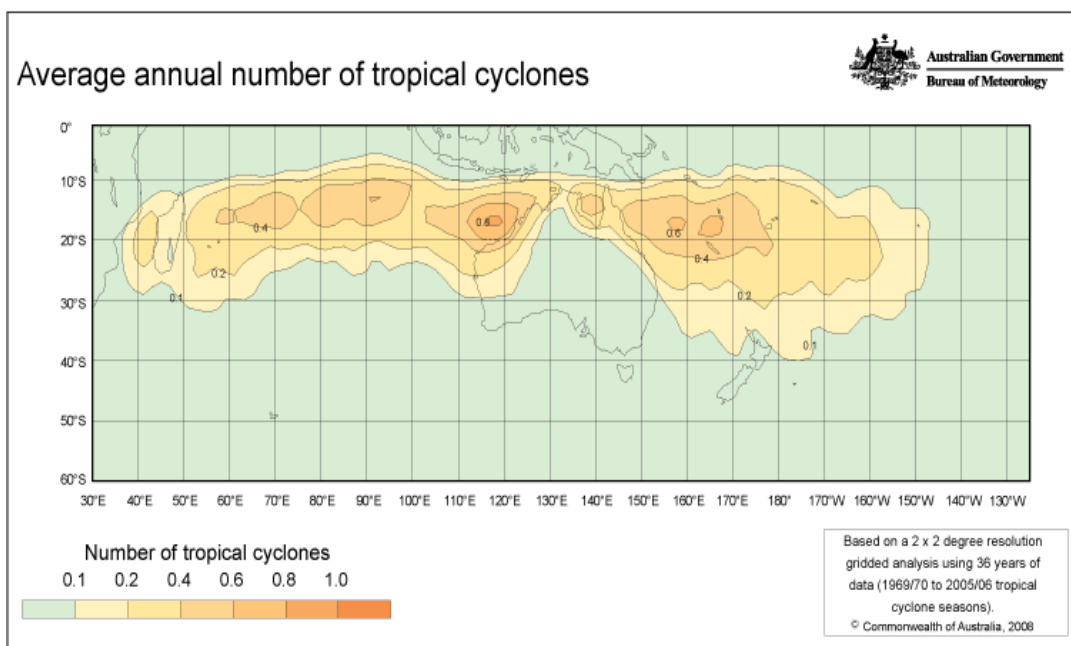
The region along Western Australia’s north-west coast, between Exmouth on the North West Cape and north to Broome, is, according to the Bureau of Meteorology (BOM), ‘the most cyclone-prone part of Australia’s coastline.’

Most of Western Australia’s offshore oil and gas industry is located in this region and is regularly subjected to severe weather conditions, such as cyclones. With many energy developments situated in waters near the coast and offshore along the state’s north-west coastline, tropical cyclones present a particular hazard for this industry sector. Australia’s cyclone season is from November to April, though few have occurred in November. The BOM states that further west, however, in the Indian Ocean, ‘cyclones can occur all year around although the risk of one in the winter months is very low’.

Tropical cyclones are defined by the BOM as ‘low pressure systems that form over warm tropical waters and have well defined wind circulations of at least gale force strength (sustained winds of 63 kilometres per hour or greater, with gusts in excess of 90 kilometres per hour).’

The Pilbara region is also the most prone to severe cyclone impacts. According to BOM, ‘seventy-two of a total of 146 coastal crossings in Australia between 1970-71 and 2003-04 were in WA’. Also, ‘thirty-four of the total forty-two severe cyclone crossings occurred in WA. Most of these occurred between Broome and Exmouth.’ This means that, on average, WA has 2.2 cyclone crossings per year, one of which, again on average, is considered severe. (Figure 1)

(Figure 1) Average Annual Number of Tropical Cyclones (1969/70 – 2005/06)



Source: Bureau of Meteorology

Several severe tropical cyclones (TC) have hit the Pilbara Coast over the last decade. Two of the more recent ones that crossed the Pilbara coast line last year were: category five² TC Paul on 21 December 2009 and category two TC Dominic on 27 January 2009. The latter cyclone crossed just 12 kilometres east of Onslow.

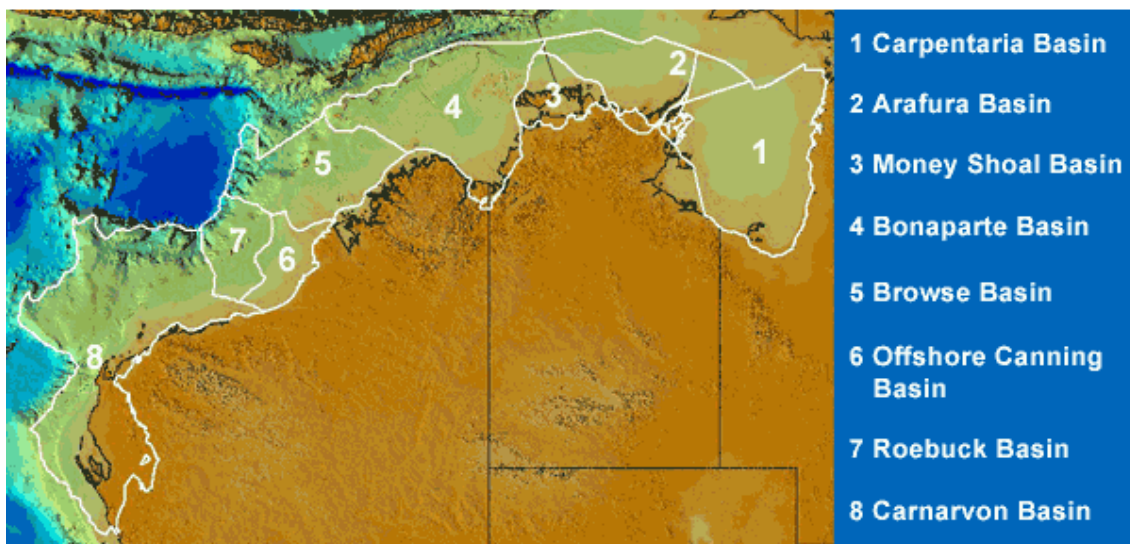
During the period 3-10 March 2007, TC George was one of the most destructive recent cyclones to have an impact on Port Hedland. Not since TC Joan in 1975 had the region suffered such a severe storm. It crossed the Pilbara coast 50 kilometres northeast of Port Hedland on 8 March 2007 and the BOM records that TC George was responsible for ‘three fatalities and numerous injuries at locations south of Port Hedland’. However, ‘less than two percent of buildings in the greater Port Hedland area (i.e. including South Hedland) sustained structural damage’.

According to PHPA in its 2008-09 Annual Report, ‘due to effective management, minimal disruptions were experienced due to the passage of tropical cyclones off the coast this past season, with a total of just 37 hours lost to port closure from 1 July 2008 to 30 June 2009.’

Cyclone Research

At present, there is a lack of depth in the information available about the risk posed by the impacts of cyclones. This is especially true for new projects like those in regions like the Pilbara and further north in the offshore Kimberley region, such as the Browse Basin. There is a similar problem in the Carnarvon Basin, which includes Gorgon on Barrow Island, and a host of other onshore and offshore oil and gas developments. Due to their location, they are periodically subjected to weather extremes such as cyclones. Offshore gas basins across North West Australia and, in particular, North West Western Australia, are shown in Figure 2, illustrating the regions which can be affected by tropical cyclone activity.

(Figure 2) North West Australia’s Gas Province: Offshore & Marginal Basins



Source: GeoScience Australia

² The Bureau of Meteorology defines a Category Five cyclone as: ‘Extremely dangerous with widespread destruction. A Category 5 cyclone’s strongest winds are VERY DESTRUCTIVE winds with typical gusts over open flat land of more than 280 km/h.’

One project that is investigating and assessing the impact of cyclones on the oil and gas sector is one between the University of Western Australia's (UWA) Oceans Institute and Perth-based energy company Woodside. During the fourth quarter of 2010 they were awarded a three-year Australian Research Council (ARC) grant. The grant has been described by UWA as an opportunity to collaborate on ways for 'predicting the ocean's response to tropical cyclones, leading to improvements in the way the oil and gas industry designs and operates current and future offshore projects.'

'The project will make direct measurements in the ocean and use this to develop numerical models to describe the intense stirring of the shelf waters caused by cyclones moving over the shelf,' Professor Ivey said.

'The work will lead to a paradigm shift for the offshore oil and gas industry in developing their response to the hazards imposed by tropical cyclones.'

In an interview with *ABC Online* on 10 November 2010, Professor Ivey said 'there's a lot of engineering infrastructure associated with the oil and gas activities offshore and what we're really trying to understand is just what is the impact on the ocean caused by these cyclones.'

Professor Ivey added: 'The concern is that there are new developments going on all the time in ever-deeper waters, and certainly further north up into the Browse Basin area. It's in these new areas that we'd really like to be able to essentially forecast what the impact of the cyclones is going to be.'

The research to be conducted between UWA and Woodside will not only be developing better responses to cyclonic behaviour, it will also provide for safer oil and gas platforms. The research will involve placing instruments in the path of moving cyclones to measure what level of disturbance they create.

Conclusion

The Pilbara ports continue to increase their central role in exporting iron ore shipments to markets across the globe. Increasing the capacity of the Pilbara ports and constructing new sites, will meet greater export demands for minerals and energy, especially for iron ore and LNG. Ongoing investment decisions by the major mineral and energy companies, especially the iron ore producers, such as BHP Billiton, Rio Tinto Iron Ore and Fortescue, have demonstrated their combined confidence in their commodity and continued market demand; their projects will contribute strongly to the region's long-term economic growth, no matter what the weather brings.

Any opinions or views expressed in this paper are those of the individual author, unless stated to be those of Future Directions International.

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