



ACIL Tasman
Economics Policy Strategy

Infrastructure and Energy in the Pilbara

Presentation to
Mining the Pilbara

by

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Topics to be addressed

- Iron ore demand
- Iron ore expansion
- Port capacities
- Labour demand
- Pilbara energy supply and demand
- Conclusions

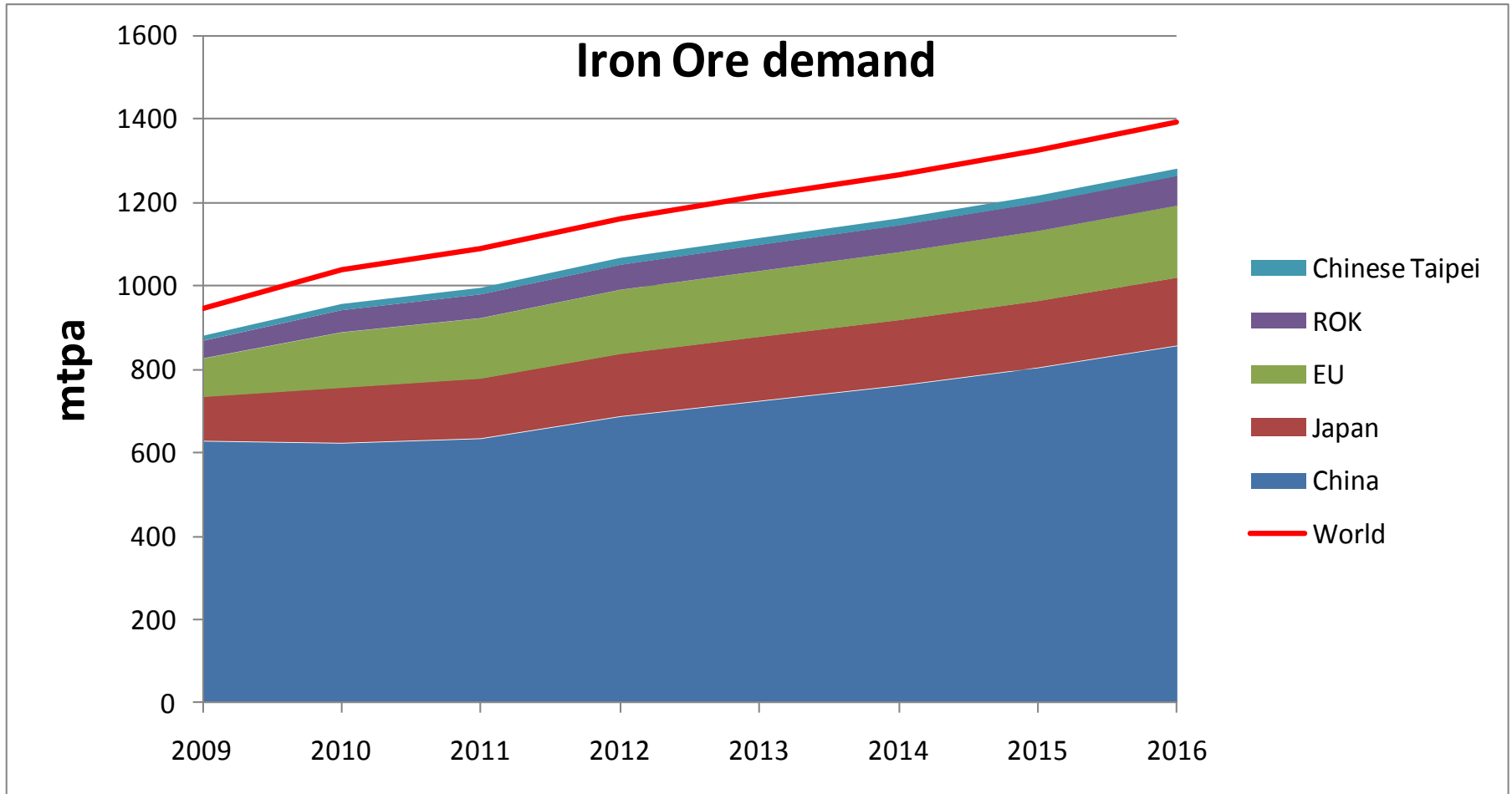


Iron ore demand forecasts

- Forecasts vary, but the direction of growth is unambiguous
- Other regions in Australia are trying to capture demand growth, eg the midwest in WA, SA, Albany, but the vast majority of iron ore will come from the Pilbara.
- Colin Barnett said last week: “WA’s iron ore production, driven primarily by steel production in China, was confidently expected to increase from ..400mtpa to ..700 to 800 mtpa by 2020”. He also predicted “ ...this State will be producing something around 60mtpa of Ing by 2020.”

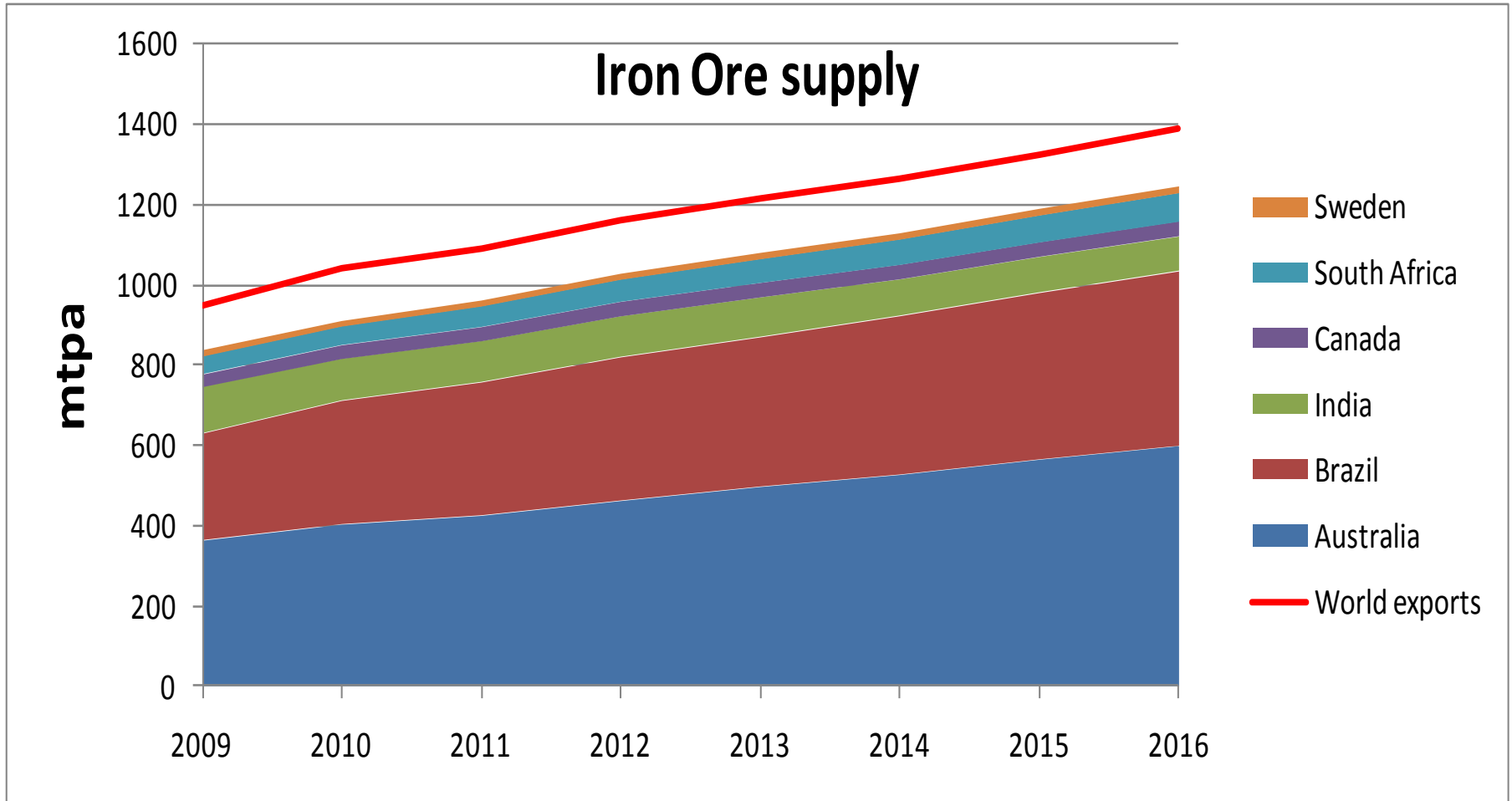


ABARES demand Forecast





ABARES supply forecast





Expansion plans - BHPB

- 25 March 2011
 - US \$ 7.4 bn to deliver 220 mtpa capacity
 - US \$ 3.4 bn for Jimblebar mine and rail etc for 35 mtpa
 - US \$ 2.3 bn for berths, shiploaders, a car dumper, etc
 - US \$ 1.7 bn for port blending facilities and rail yards
 - Jimblebar in operation in 2014



Expansion plans - RIO

- Annual capacity 220 mtpa
 - Plans to increase to 283 mtpa by 2013
 - Then increase to 333 mtpa
 - Recent announcement to spend US \$ 676 m to accelerate 333 mtpa capacity by early 2015
 - Cost of expansion ~ US \$15 bn
 - Workforce will increase by 6000 from ~ 10,500



Expansion plans – FMG

- 19 November 2010:
 - Expand production from 55 to 155 Mtpa
 - Cost
 - Port & Rail US\$4.6 bn
 - Chichester Hub US\$ 1.5 bn
 - Solomon Hub US\$ 2.3 bn
 - Total US\$ 8.4 bn
 - Complete by June 2014



Expansion plans - Atlas

- Growth plans from 6 to ~ 15 mtpa based on trucking operation, then rail for further growth
- ~ \$900 million capex to get to 15 mtpa
- Focus is on low cost operations close to infrastructure esp ports.



- New project under development
- 30 mtpa first stage
- Cost
 - Mine A\$ 1322 m
 - Rail A\$ 1779 m
 - Port A\$ 1825 m
 - Epcm A\$ 319 m
 - Contingency A\$ 529 m
 - Total A\$ 5774 m
- Target end 2014, using Anketell



Another project - Aquila

12 May 2011

- PFS results for the Hardey Project
- Capex A\$ 1.6 bn
- 10 mtpa capacity
- Completion expected 2016

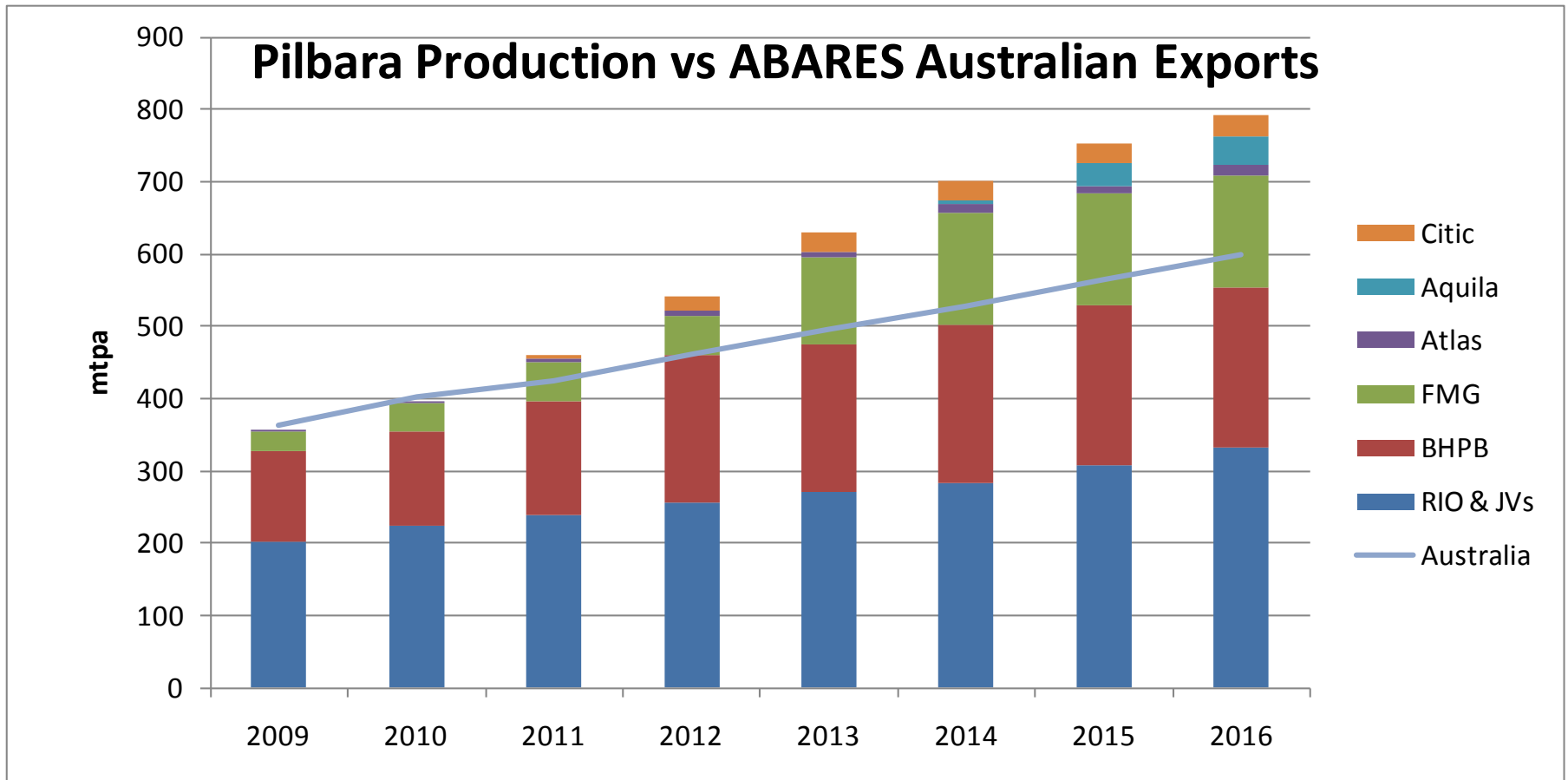


Other iron ore activity in the Pilbara

- CITIC – currently commissioning a 28 mtpa magnetite operation destined for China. In this analysis, we have not increased the output from this project, but it has the ore reserves available to support expansion.
- IOH – seeking reserves and infrastructure access
- BC Iron in production
- etc



Something may have to give



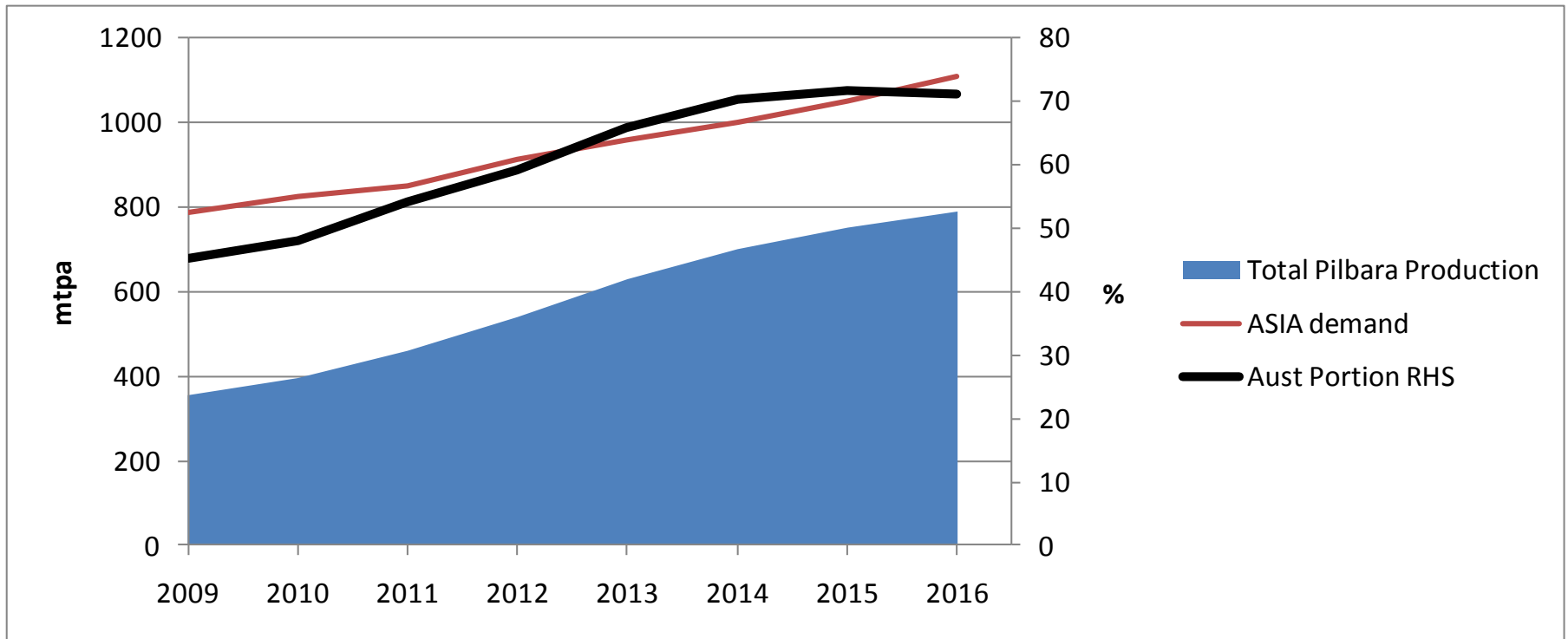


Observations on the iron ore market

- The small Pilbara producers may struggle to secure sales unless they are low cost or have an ownership tie to the buyers
- Other exporters may not meet their export ambitions, allows the Pilbara to fill the gap.
- Asia becoming increasingly reliant on Australian iron ore under this scenario
- The midwest developments may struggle to secure sales

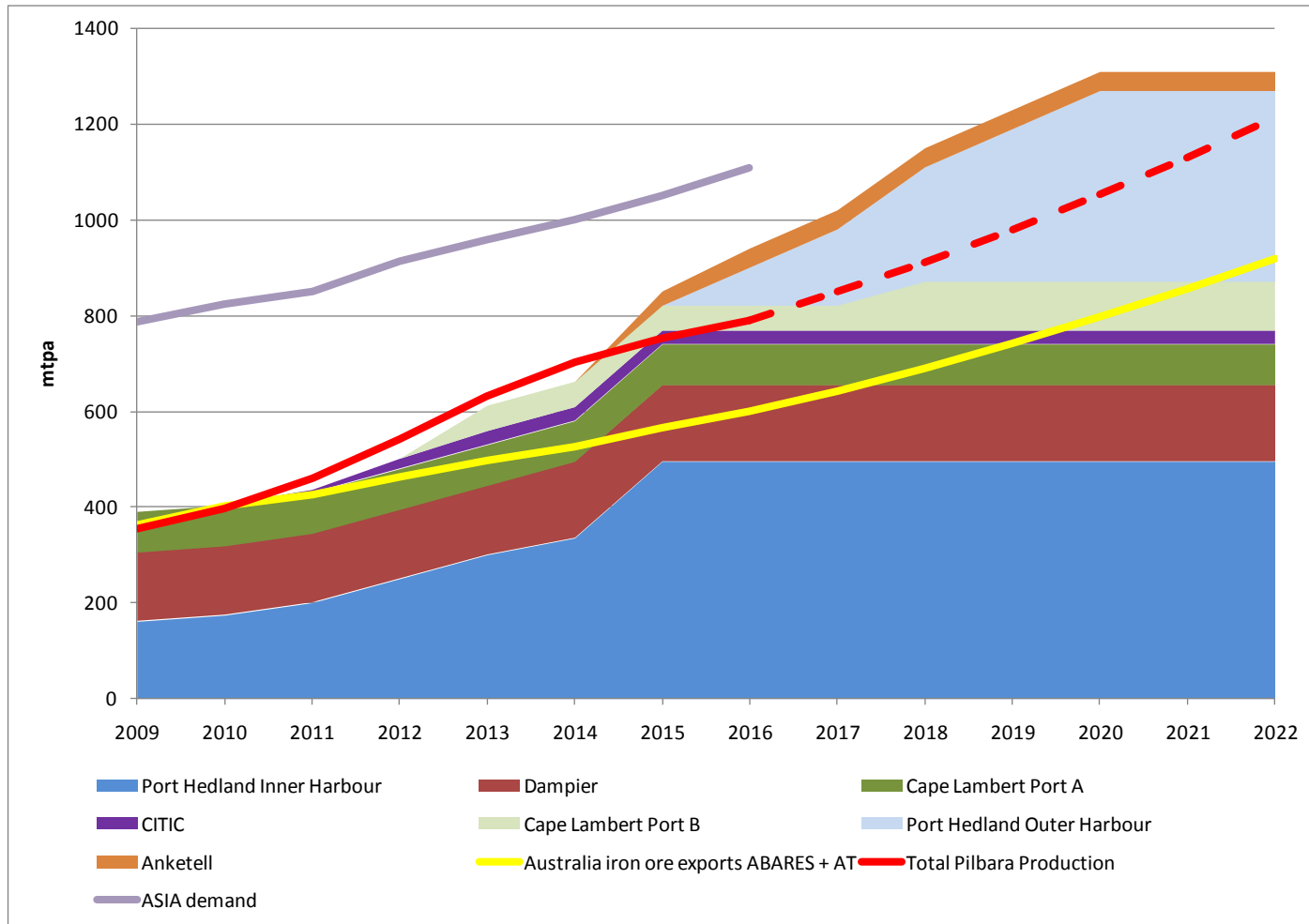


Australia's portion of iron ore sales to Asia



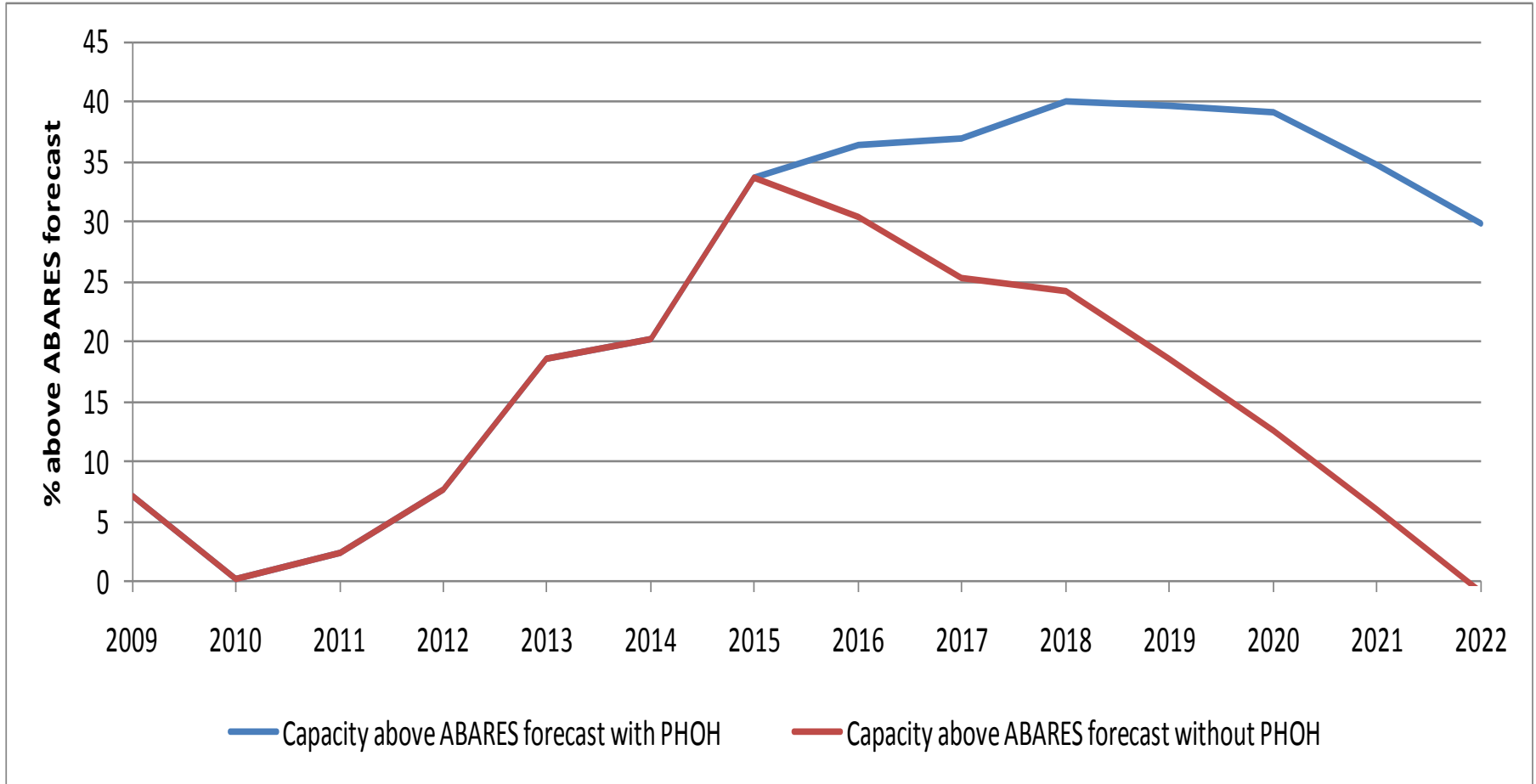


Port capacities and expansion plans





Pilbara port's spare capacity





Observations on port capacity

- 4 existing ports would be sufficient until ~ 2020 based on ABARES and AT projections
- Individual producers are attempting to secure additional sales, which requires acceleration of port development to maintain their sales at production capacity
- Eventually, buyers will have to determine if they are willing to be so reliant on Australia as a supplier
- If they are not, then some port capacity will be under utilised, since long term contracts are not available to secure throughput
- Difficult to see the market opportunity for the Oakajee Port with a likely port capacity surplus in the Pilbara



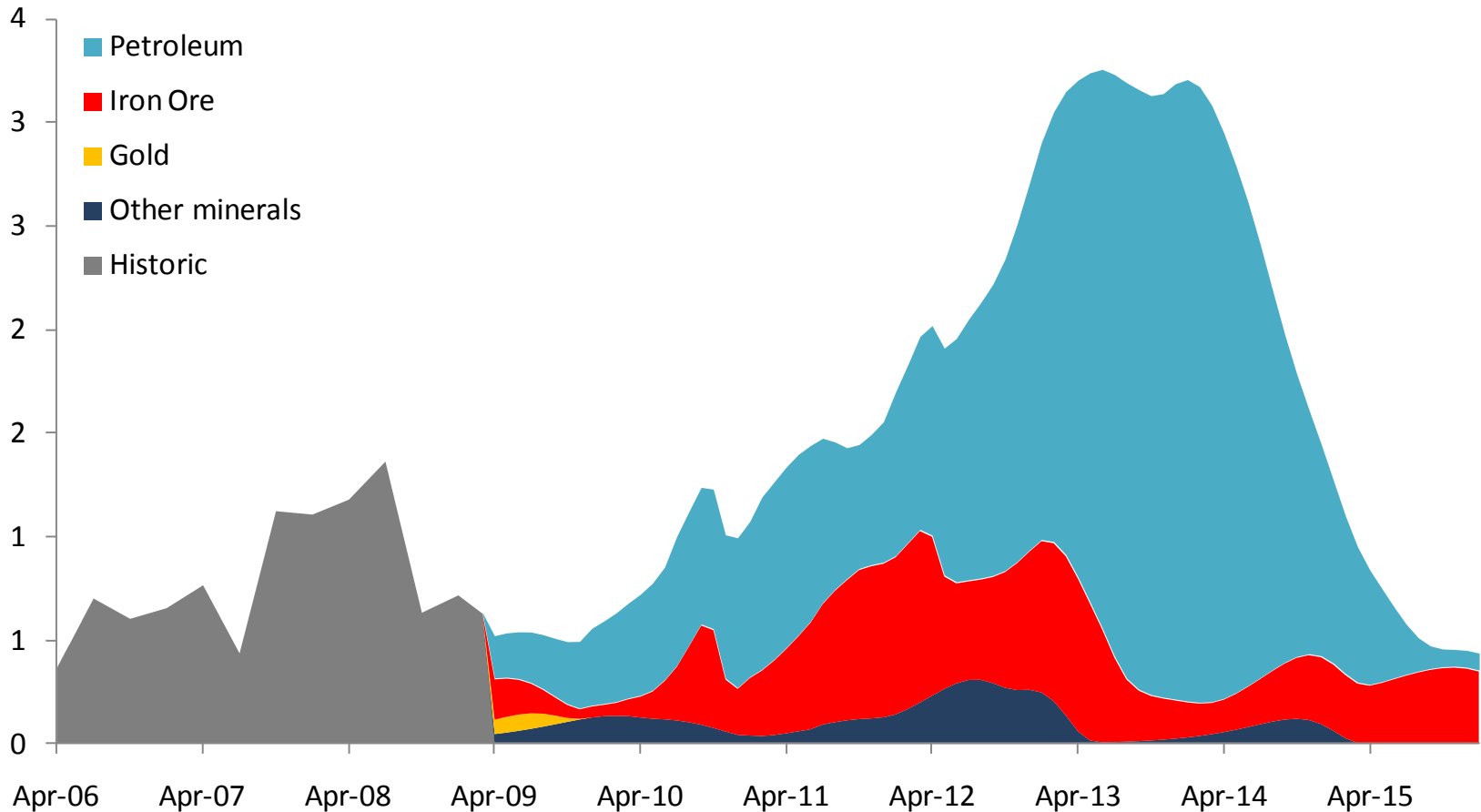
LNG developments

- Simultaneously with the iron ore expansions, the LNG industry is experiencing major growth
- In the Pilbara
 - Gorgon LNG will be online by 2015, producing 15 mtpa in 3 trains at a cost of around \$43 bn
 - Pluto LNG will be complete in 2012, producing 4.3 mtpa in 1 train at a cost of around \$12 bn
 - Wheatstone LNG project is imminent, with FID due later this year. This will trigger a 2 train 8.9 mtpa project at a cost of around \$25 bn, with completion in 2016
- In the Browse
 - Prelude floating LNG project is underway
 - Ichthys LNG (INPEX) is expecting to make a FID this year
 - Browse LNG at JPP is progressing, and could secure approvals in 2012
- In Queensland, several LNG projects are underway or planned at Gladstone using CSG, all planning to be operational in this decade.



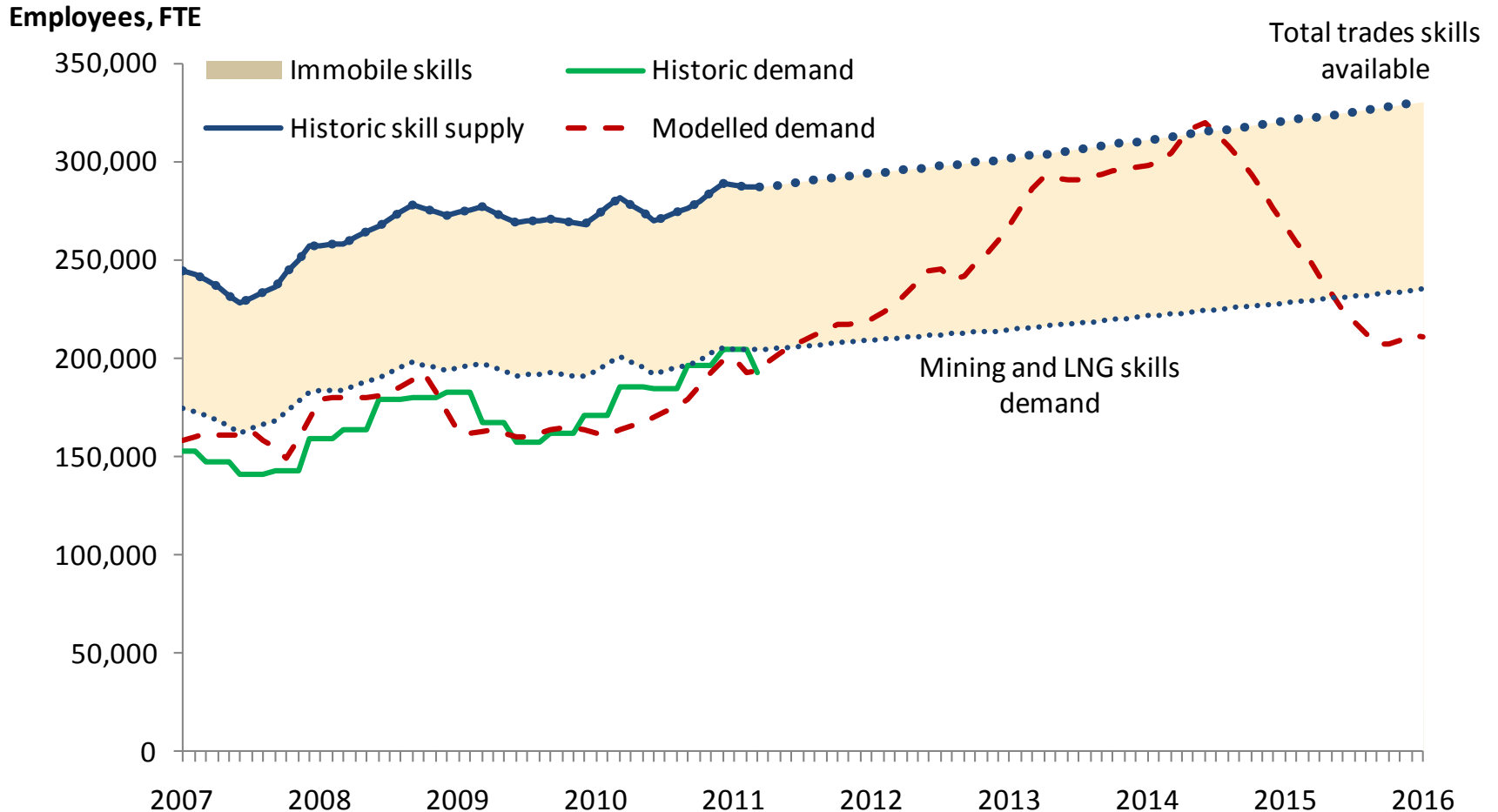
WA capital expenditure projection

\$ billion per month



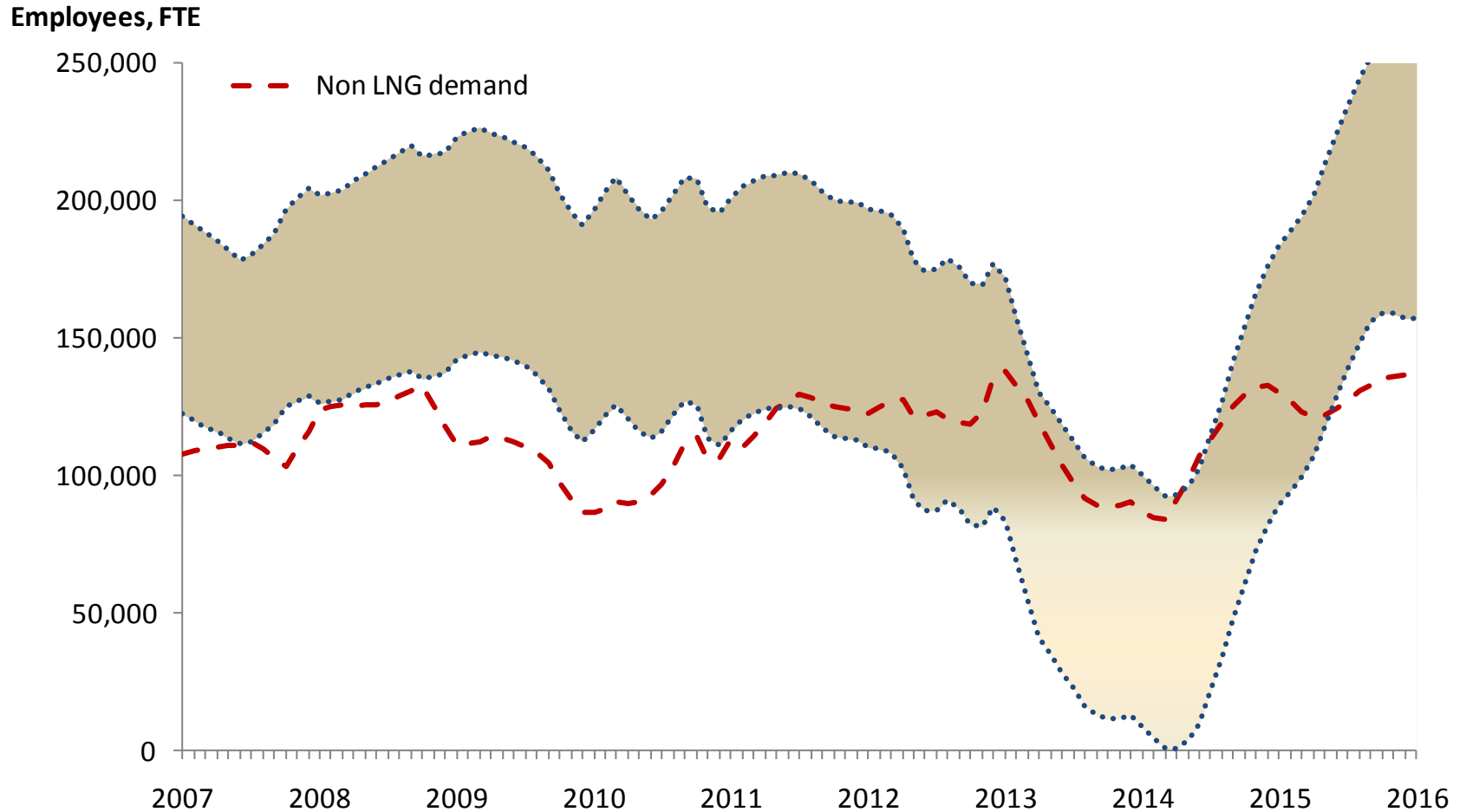


Labour demand in WA





Labour demand after LNG





Observations - labour demand

- Very tight labour supply until 2015
- Labour cost escalation seems inevitable. LNG project imperatives will drive the projects to completion, hence they will be forced to pay whatever it takes
- This is a return to a pre GFC situation in which trades skills were very difficult to obtain
- Project slippage seems likely as costs rise (e.g. Midwest), some LNG projects may also slip, but Gorgon and Wheatstone will continue and therefore relief will not be significant
- Labour will have the opportunity to choose where it wants to go, which will lead to regional competition to attract and retain labour e.g., Port Hedland, Karratha, Broome, Geraldton, Gladstone, Darwin



Pilbara energy supply – current situation

- In general, industrial electricity supply in the Pilbara is self generated, with little interchange between ore producers
- Town supply is either self generated or supplied by Horizon Power
- Fuel is either gas or distillate.
- There is no commercial coal deposit in the region



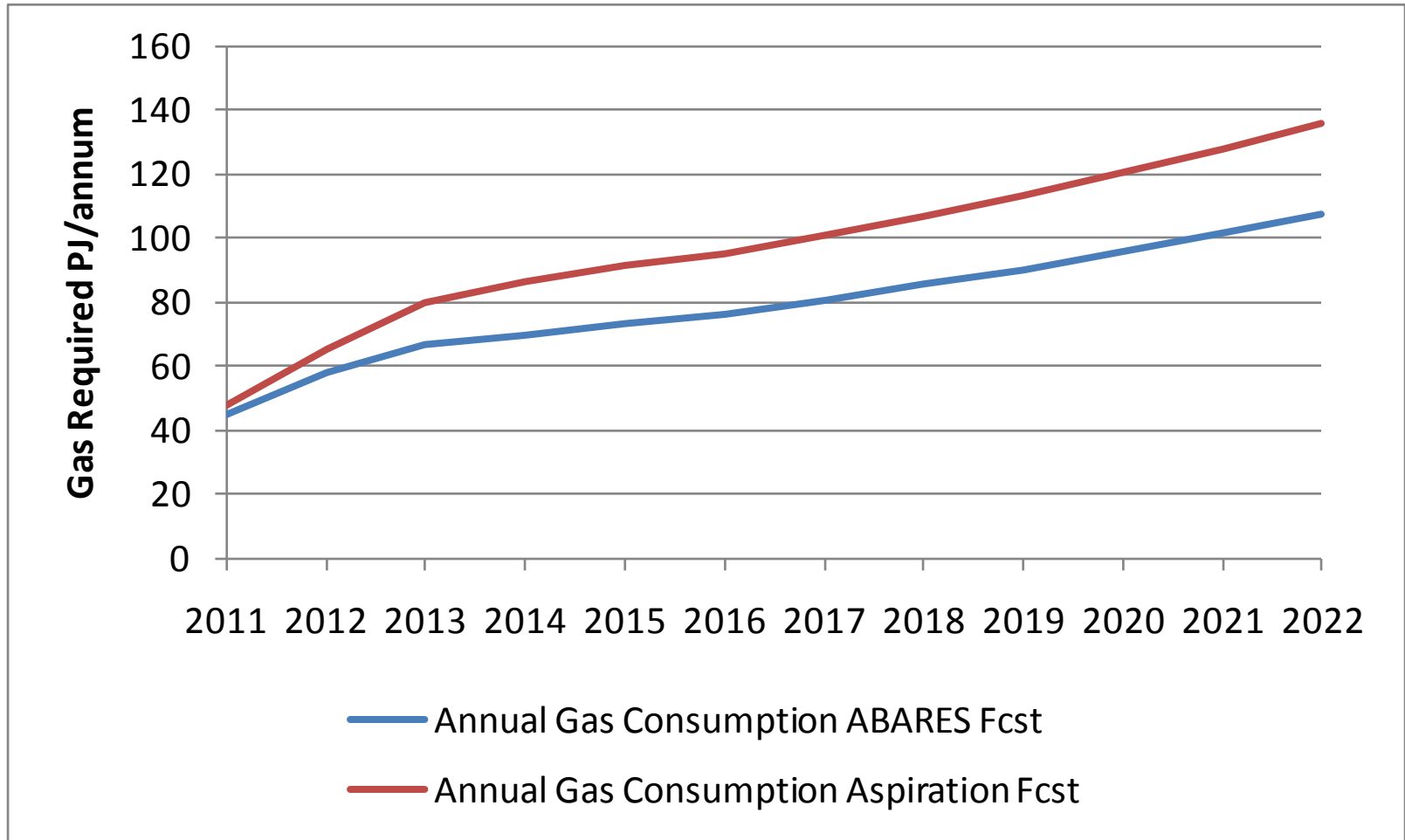
Pilbara gas demand for iron ore

Assumptions

- Assume haematite requires 8.9 GWh/Mtpa of electricity, magnetite requires ~100 GWh/Mtpa.
- Assume haematite generation is open cycle GT, magnetite (e.g. CITIC) is combined cycle GT
- Assume CITIC remains at 28 Mtpa. This is a critical assumption.
- Ignore the energy demand of the towns and the LNG industry.
- Assume gas is the sole fuel in the Pilbara



Pilbara Iron Ore gas requirement





Availability of gas

- The ABARES forecast requires 949 PJ of gas from 2011 to 2022
- The aspiration forecast requires 1 172 PJ of gas from 2011 to 2022
- This is the equivalent of 1.6 to 2 MT of LNG per year (Gorgon 15 MTPA, Wheatstone 8.9 MTPA, NWS 16 MTPA, Pluto 4.3 MTPA).
- There is a significant shortage of gas for use in WA, and it is most unlikely that the Pilbara could obtain this quantity of gas.
- This will force mines onto distillate, with resultant cost and logistic issues, and
- This will in turn affect the viability of some projects.



Energy supply to the Midwest

- The midwest is dominated by magnetite projects. The energy intensity of these projects, and the gas transport differential in the DBNGP of the Pilbara, means that in an environment with a shortage of gas, the midwest is heavily disadvantaged.
- The midwest may be able to secure some coal based electricity, but this has several significant obstacles at present.



Observations on gas supply

- The LNG boom in the Pilbara will have a double impact on the iron ore industry, through labour supply and costs, and through the creation of a shortage of domestic gas through rapid growth in exports as LNG.
- The major iron ore producers may be able to secure gas supplies, but the new entrants will struggle.
- There is a general perception that gas is available, albeit at high prices. This is not supported by the known facts.
- There is insufficient information available to WA industry on the state of domestic gas reserves in the Carnarvon Basin. This hinders long term planning by industry. A new disclosure regime is needed, it is not sufficient to rely upon a 15% domgas allocation rule.



Conclusions

- Labour supply and energy supply are emerging as critical issues for the development of the Pilbara.
- WA is most unlikely to be able to support simultaneous rapid expansion in LNG and iron ore exports.
- The 15% allocation of gas from LNG export projects is insufficient to supply the domestic gas market
- It is probable that iron ore developments will slow.
- WA appears to be overbuilding its port capacity in the Pilbara
- The creation of a magnetite based export facility at Oakajee looks difficult given the growth plans for the Pilbara, the scarcity and cost of labour and the energy penalties facing the mid west projects.



Thankyou.

Mark Chatfield