
A REPORT FROM PORT JACKSON PARTNERS COMMISSIONED BY ANZ

ANZ insight

Earth, Fire, Wind and Water:
Economic Opportunities and the
Australian Commodities Cycle

ISSUE 1, AUGUST 2011

FOREWORD

ANZ insight is a series of client reports commissioned by ANZ. The series seeks to explore the implications of the increasingly interconnected nature of business and economic activity in the Asia Pacific region.

It reflects the importance ANZ attaches to building common ground among business and among a diverse range of stakeholders, in order to advance economic relationships and growth in the region.

The series has been developed from ANZ's outward-looking orientation, as Australia and New Zealand's international bank. We believe this allows us to make a unique contribution with our clients to the discussion of issues related to the Australian, New Zealand and Asia Pacific economies.

'Earth, Fire, Wind and Water: Economic Opportunities and the Australian Commodities Cycle' is the first report in the series. The report was researched and completed by Port Jackson Partners in August 2011. Port Jackson Director Angus Taylor is the author.

The aim of the report is to quantify the size of the economic 'prize' open to Australia as a result of the current resources cycle which is being driven by the shift in global economic growth to Asia and to other emerging economies.

The work completed by Port Jackson Partners is high-level and does not claim to hold all the answers. The report does however provide a framework to advance a discussion with clients on the opportunities and challenges which are resulting from the commodities cycle.

This is a condensed version of the report. An extended version which provides additional data and commentary is also available for interested clients.

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This report highlights the opportunities and benefits can accrue more broadly than is commonly understood. Well over half of the market capitalisation of Australian Securities Exchange (ASX)-listed companies is made up of businesses that either produce commodities or which provide important support services and supplies to commodity exporters. These specialist service providers cover most aspects of the commodity value chain, and many are establishing or have established global leadership positions in their niches. The domestic sales of specialist commodity service providers and suppliers could grow to around \$200 billion by 2030. This cluster of export oriented service providers is positioned to extend its reach beyond Australia's natural resources endowment. At the same time, the rapid growth in resources, energy and agricultural export demand combined with rising Asian incomes to create a platform for growth in other service industries, such as education and tourism.

2 Gross investment, not net of imports.

Embracing the opportunity can deliver broad based and sustained benefits for Australia. Higher incomes flow from higher productivity levels and additional profits for Australian investors. Increased consumer purchasing power results from higher exchange rates. There are also opportunities to deliver benefits through growth of natural resource support clusters providing inputs and services. Increased incomes should support increased consumption from domestic service sectors, extending the benefits well beyond the natural resource sectors. Finally, it will provide a platform for future non-commodity exports into Australia's new trading and investment partners.

One of the central themes of this report is that Australia faces ferocious competition globally and will need to consider active steps if it is to capture its share of this growth. Competing countries are keen to capture a share of this global opportunity and many are gaining support from China and India. Australia's commodity exporters (across energy, minerals and agriculture) and their service providers need to rapidly develop new skill sets, focused on developing new resources or expanding existing ones. The nation's capital markets are also coming to terms with this new environment. They will need to see the natural resource sector as a growth sector, not a mature cash generating sector. In addition, it will be the institutional and policy frameworks adopted by resource-rich countries, and their ability to attract and motivate leading organisations and investors to seize the opportunity, that will determine the winners. High quality resources will not be enough.

There are challenges for Australia. Markets and businesses will reallocate economic capacity to the uses with the highest returns. This could lead to some crowding out of non-resource sectors of the economy, such as non-resource related manufacturing³, as economic resources move across the economy.

One option is to slow growth in commodity sectors to avoid crowding out other sectors and to minimise the risks in the event the commodity boom proves to be short lived. Businesses with fewer growth opportunities and more competitive pressures would be protected from high exchange rates and rising costs and would not be impacted by adjustments that result from the continued expansion of the commodities sector. In this scenario, which assumes Australia is facing a short-run boom rather than a global transformation, the downside is the significant opportunity cost.

Another option is to proactively build the capacity to support growth. This means adding supply side capacity (skilled labour, growth financing, technology and land for commodity production) to capture the growth, while minimising the crowding out of existing economic activity. It will then be for the private sector to align its strategies with the growth opportunity, by building and leveraging suitable growth capabilities.

Relieving pressure on the economy and ensuring that there are flow on benefits will require a broad-ranging discussion about what Australia needs to do and a new focus on reassessing its options and opportunities in light of the changing global economy. This discussion has become even more important following the GFC, which had the effect of accelerating the historic shift we are seeing in global economic growth to the developing world.

Capturing as much of the opportunity as possible would provide unprecedented benefits to the Australian economy. Australia is uniquely placed to provide the poor of the world with the resources needed to lift their standard of living. If Australia gets this right, it can be the lucky country, the clever country and a good global citizen.

³ Parts of manufacturing offering mining services or process commodities may benefit.

2.0 INTRODUCTION – THE NATURE OF THE OPPORTUNITY AND CHALLENGE

KEY THEMES:

- *In recent years, the Australian economy has benefited enormously from growth in demand for commodities, as increasing export revenues and accelerating business investment have begun to replace consumption led growth.*
- *Meanwhile, significant new challenges are emerging:*
 - *Australia can't continue to rely on commodity price rises to support growth – rapid volume growth is now critical.*
 - *Productivity gains across the economy have slowed.*
- *But questions remain:*
 - *Will the opportunity last, or is it a temporary boom?*
 - *Can Australia sit on its resources and expand production in its own time?*
 - *Will the flow of benefits have broad reach across the economy?*
 - *Will crowding out impact large parts of the economy?*
 - *Is Australia returning to a low-skilled farm, dig and deliver economy?*

2.1 SUPPORTED BY THE BOOM...SO FAR

Australia's economic performance in recent years has been extraordinary. For example, GDP increased by an average of 5.3% per annum from 2004 to 2009 versus an average of 3.6% per annum across other OECD countries in nominal purchasing power parity terms⁴.

Much of the strength of the Australian economy until the GFC was derived from private sector investment and growth of exports (Exhibit 2.1). These two factors were, in turn, driven by Australia's commodity-export industries and the sectors that support them. While the GFC saw a pause in this process, commodity sector led growth has since returned strongly. It is now broader based than before the crisis, and it extends to agriculture and energy.

To put this in perspective, from financial years 2004 to 2009 the rise in gross commodity exports was equal to more than 50% of Australia's total growth in GDP, even after adjusting for the increasing exchange rate. Meanwhile, from financial years 2004 to 2008 growth in private investment equalled about one third of economic growth, and much of this growth in investment was driven by resource projects. Indeed, minerals and energy investment has increased around 2.5 times over the last six years, rising from 2% to 4% of GDP. Service sectors supporting Australia's commodity sectors also grew over this period, with the number of people employed estimated to have increased by around 40% since financial year 2003 (Exhibit 2.2). This increase in commodity-related exports, investment and employment contributed to Australia's reorientation of trade away from Europe and the United States towards Asia from the early 2000s onwards.

As recovery by other advanced economies remains weak, Australia continues to benefit from strong growth in China and the rest of the developing world. Indeed, in recent economic data we see that Australia is in relatively good underlying health, despite sharp increases in savings, falling economic stimulus and the short term impact of natural disasters. Australia's public debt⁵ and unemployment rates⁶ remain well below other major OECD countries, terms of trade are at a 60-year high, and the currency has gone beyond parity with the American dollar⁷. In the new era of developed economic austerity, few countries can claim this kind of robustness.

⁴ IMF World Economic Outlook 2010.

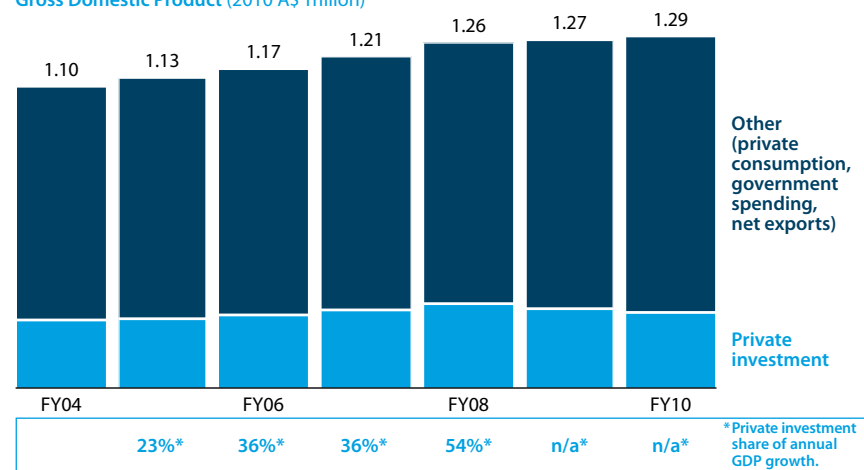
⁵ Australian Government Treasury 2010-2011 Commonwealth Budget.

⁶ IMF International Financial Statistics, 2010.

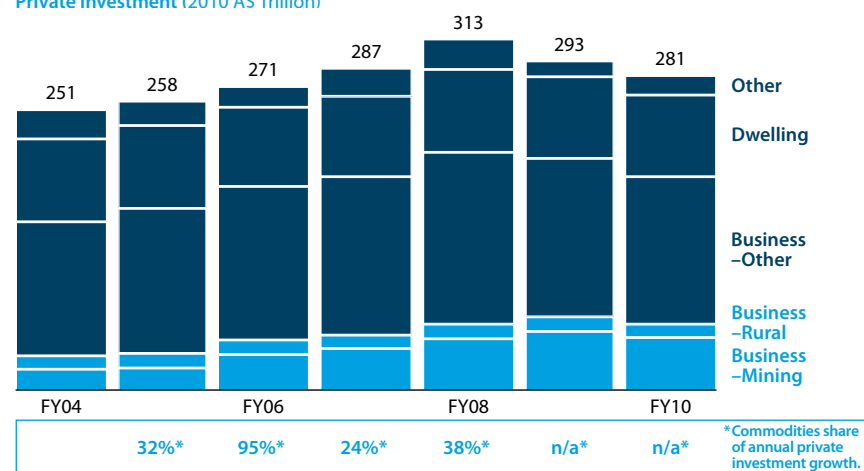
⁷ Reserve Bank of Australia, 2011, "Statement on Monetary Policy May 2011", p. 27.

Exhibit 2.1
AUSTRALIAN ECONOMY

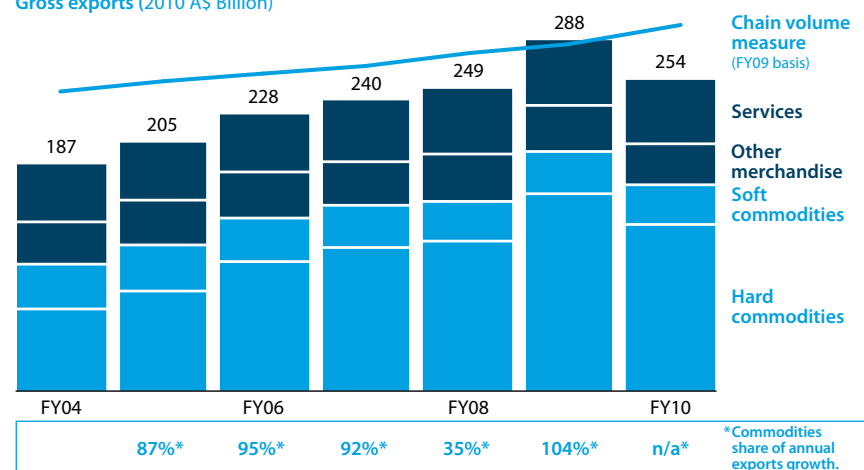
Gross Domestic Product (2010 A\$ Trillion)



Private investment (2010 A\$ Trillion)



Gross exports (2010 A\$ Billion)



Source: ABS National Accounts; ABARE Commodities report.

Exhibit 2.2
SELECTED COMMODITY SUPPORT SERVICES
FY11 – COMMODITY RELATED PROPORTION OF SECTOR ONLY*

Sector	Revenue \$ Billions	Industry value added \$ Billions	Profit \$ Billions	Businesses (enterprises) Number	Employees	
					FY03 Thousands FTEs***	Current (FY11)
Mining services	7.8	3.0	1.1	90	11.3	16.0
Engineering consultancy services	7.8	4.3	1.3	4,425	21.0	30.6
Heavy industry and other non-building construction	27.0	12.2	6.8	2,250	41.6	67.5
Plant hire and leasing	1.8	0.9	0.2	2,527	4.8	6.7
Explosive manufacturing	1.4	0.4	0.1	18	1.0	1.3
Machinery and equipment wholesaling**	13.5	2.9	0.9	2,791	16.7	18.8
Surveying Services	0.8	0.5	0.2	525	2.7	3.6
Port operators	1.3	0.4	0.1	8	1.0	1.1
Rail freight transport	6.9	3.1	0.7	16	20.4	29.0
Road freight transport	6.8	1.9	0.3	8,175	20.0	20.4
Shearing, cropping and other services to agriculture	5.0	1.4	0.5	20,800	22.4	28.0
Farm and construction machinery wholesaling**	5.4	-	0.7	669	0.0	8.1
Fertiliser manufacturing	2.9	0.7	0.3	9	2.4	2.4
Pesticide manufacturing	0.8	0.2	0.0	11	1.2	1.2
Scientific research	1.0	0.3	0.0	1,667	4.8	5.2
Total	90.3	32.1	13.2	43,980	171.2	239.8

+40%

* Estimated proportion of total sector attributable to commodities only (estimate based on revenue share).

** Mining and agricultural machinery manufacturing assumed to be included in wholesaling and therefore not included separately.

*** FTE (Full Time Employee) equivalent estimates based on Nov 2010 quarter actuals proportion of part-time workers in sector and relative hours for full-time and part-time workers – sectors with less than 10% of part-time workers assumed to be 100% full-time as a simplification.

Source: IBISWorld Industry Reports, 2010; ABS Labour Statistics, Nov 2010; PJP analysis.

2.2 CHANGING ECONOMIC CONTEXT PROVIDES THE OPPORTUNITY FOR A NEW DISCUSSION

Given the underlying health of Australia's economy, the emerging discussion of a new era of economic reform in Australia may seem odd. As commentators have now highlighted⁸, the substantial economic transformation of recent decades has begun to slow, and this is now starting to present itself in the data on Australia's productivity growth⁹.

History suggests significant economic reform is most often achieved if a broader economic context is recognised and embraced, and gains traction if there is a clear rationale for change. The reforms of the 1980s and 1990s were driven by a well-founded concern that Australia was losing global competitiveness. Australia recognised that its economy was too inflexible and inward looking to deal with a fast, globalising world. Commodity prices were facing continual downward pressure, growth in the developing world was sluggish, and commodity exports were a falling share of the Australian economy. During this period of reform the prevailing view was that Australia's future success depended on moving away from primary industries and towards 'new economy' service industries such as finance, technology, education and research and development (R&D)¹⁰. The reforms to financial markets (e.g. floating the Australian dollar), labour markets (e.g. the Prices and Incomes Accord), taxation policy (e.g. the Goods and Services Tax) and industry policy (reduced tariffs) were all built on an understanding that the world was moving fast, and Australia was at risk of falling behind.

Yet the shift in the source of global growth to the developing world means that many of the fastest growing sectors are now in basic materials, energy and commodities. Natural resource-related sectors can form the cornerstone for Australia's growth and productivity gains in the coming years. This doesn't mean Australia must or should turn its back on higher value service sectors. Indeed, the natural resource opportunity is capable of generating and supporting such activity elsewhere in the economy.

2.3 CONCERNS ARE UNDERSTANDABLE: BUT WE CAN DO BETTER

The current discussion about the impact of massive new demand for Australia's resources has the opportunity to go beyond the risks and challenges to look at the steps that can be taken to seize and manage the opportunity for maximum benefit.

Some of the views that are being expressed and which are explored in this report include:

1. "All booms must end".

- According to this view, the benefits are fleeting and therefore do not justify the structural adjustments required to participate in the 'boom'.
- Chapters 3 and 7 will show that under reasonable assumptions about continuing developing world growth, the growth in demand for commodity exports will continue for decades, not years.

⁸ Paul Kelly, a long-term commentator on economic reform, has argued that "the historic post-1983 reform era is terminated". Ross Garnaut, one of Australia's leading economists, has said: "Economic policy since the GST [2001] has been characterised by *change*, rather than productivity enhancing reform. Attempts at major reforms have failed comprehensively and poisoned the well for further reform for a considerable while". This has been echoed by Gary Banks, Chairman of the Productivity Commission in his Keynote address to the Annual Forecasting Conference of the Australian Business Economists, Sydney, 8 December 2010.

⁹ 'Australia's Productivity Challenge', February 2011, Grattan Institute, Saul Eslake and Marcus Walsh.

¹⁰ As an example, see the editorial from *The Age* from August 10, 2004, 'Clever Country or Fools Paradise' where the editors say "alternatively [to becoming the clever country] Australia can rely on resource exports and become progressively uncompetitive in the global marketplace".

2. "There is a global scarcity of high-quality resources supporting low-cost positions and Australia has an unusually-large endowment of these scarce resources."

Based on this view, it is said that one way or another Australia will capture this opportunity, with little incremental effort or focus required.

- Chapter 5 will show that there is no shortage of resources in the world, including higher quality resources. The real scarcity is high quality projects to expand commodity production.

3. "The benefits from commodity export growth are narrowly based."

- Chapters 3 and 4 will show that the direct economic potential of commodity exports is often underestimated – commodity exports and related investment will soon be equal to more than 20% and 7% of GDP respectively, coming from 9.5% and 2.8% in financial year 2004.
- However, just as importantly the flow of benefits across the Australian economy are already much deeper and broader than is commonly believed, and, with the right strategy, this could strengthen.

4. "The risk of crowding out or the 'resource curse' demands caution."

According to this view, rapid growth in capital-intensive natural resource sectors crowds out other sectors (particularly manufacturing) and risks the creation of a two-speed economy with disproportionate benefits accruing to capital rather than labour¹¹.

- By adding significant economic capacity fast enough, Australia can mitigate the worst of these impacts (Chapter 6)¹².
- Australia has a far more open and flexible economy than in the past, so rapidly adding capacity is a much more realistic option than it once might have been.

5. "Enabling rapid growth in commodity exporters is taking Australia back to a farm, dig and deliver economy."

According to this view Australia will be buffeted by volatile markets, it will 'dumb down' its economy and it will face price pressures from customers.

- Chapter 3 will show that pursuing a strategy based on commodity export volume growth is different to pursuing a strategy that relies on rising prices forever.
- It is also reasonable to expect long-term prices to stay at levels high enough to encourage volume expansions, and that Australia can build a knowledge economy based on an emerging cluster of commodity export service providers.

The objective of this report is to contribute to the current discussion by laying out the size and longevity of the opportunity, the nature of the challenges and the breadth of the potential benefits. It provides a framework for a discussion from the perspective of the whole economy - not just the resource sectors. It suggests that a whole-of-economy response would maximise the benefits and ensure that they are broadly distributed. This response would require alignment between governments, businesses, capital markets and the community on a broad range of key issues. With that alignment, there would be a significant prize to be won over coming decades.

¹¹ "The Fiscal and Economic Outlook", Ken Henry, Australian Government Treasury, 16 May 2006; "The Shape of Things to Come: Long Run Forces Affecting the Australian Economy in Coming Decades", Ken Henry, 22 October 2009.

¹² Mitigation will also require freeing up capacity where possible, without undermining existing sectors. The obvious example of this is to move faster to contractionary fiscal policy.

3.0 THE ENORMOUS PRIZE AT STAKE

KEY THEMES:

- *Australia stands to gain more than \$270 billion per annum in new commodity exports over the next two decades, despite significant price reductions.*
- *This would result in an additional \$2.6 trillion in total commodity exports over that time period.*
- *Around \$1.8 trillion of investment spread over 20 years is required to support this growth in commodity exports, approximately equal to half of Australia's current total capital stock.*
- *The value of commodity exports would be equal to more than 20% of GDP annually on average over the 20 years and the investment required would be equal to almost 5% of GDP.*

3.1 FROM COMMODITY BOOM TO SUSTAINED GROWTH

Australia's experience of commodity booms in recent decades is misleading when considering the current commodities cycle. In the late 1980s and the mid 1990s there were sharp increases in prices, followed by frenzied corporate activity (usually poorly timed acquisitions and recommissioning of mothballed mines and smelters, or expansions of high-cost farming systems) followed by a downturn. The booms were transitory, with fairly quick reversions to reality. The underlying model was trendline price declines of 1-2% per annum, reflecting productivity gains. This is not the picture of the resources cycle that Australia is currently experiencing.

Until now, what Australia has called a commodity boom has been driven by rising prices. As demand surged in the early 2000s slack capacity and easy debottlenecking provided quick new volumes (at low capital cost) in most sectors. By the mid-2000s, global commodity production was not able to meet the rapid growth in demand in key sectors, resulting in sharp price increases. For the first time in many decades major and high risk new projects were required to meet the growth in demand. Producers and capital markets declined to rush into these, particularly when the financial crisis hit.

The next phase of this story will be supply side growth based on mega projects and major new technologies, with less price upside (and price downside for some commodities). Volume growth will be the new normal, not a transitory surge in prices, soon to disappear as demand eases or supply quickly catches up. As a result, the world will see massive capital intensive projects, typically with significant political, technical and commercial risk, as well as difficult new technologies and techniques, especially for agriculture.

3.2 RAPID GROWTH IN RESOURCE REVENUES AND INVESTMENT

There is potential for enormous increases in export volumes and revenues in the Australian commodity sectors over the next 20 years. To capture this opportunity, however, very large investments will be required.

Port Jackson Partners' assessment of this opportunity is based on five critical inputs.

1. Australia's current pipeline of projects, with each assigned a probability based on likelihood of completion to create a probability-weighted mix of projects.
2. These projects, together with the basic models of global commodity demand growth used in Port Jackson Partners' strategic consulting work, were used to develop three different cases (as well as a Do Nothing scenario where volumes remain flat) for Australia's market performance in each sector over the 20 years through to 2030. Box 3.1 introduces and describes the four scenarios.
3. Account has been taken of any reserve constraints in achieving these outcomes, although these are limited to a subset of commodities (gold and oil in particular). Exploration may, in time, break these constraints, but no assumptions have been made about future exploration success.
4. Account was also taken of sectors, primarily aluminium, where domestic cost structures are high and therefore have potential to impede growth.
5. Consensus prices and exchange rates, which typically means rapid reversion to long-term prices, which are lower than today's prices for most commodities. This is a conservative assumption, given persistent upward cost pressures and delays in supply growth around the world.

Based on conservative assumptions Australia could achieve a total commodity export revenue growth rate significantly faster than overall GDP for the next two decades. On reasonable estimates, total commodity exports¹³ could reach around \$480 billion (in real terms) by 2030 from \$210 billion in 2010 (Exhibit 3.1). This would mean that commodity exports would rise to be equal to more than 20% of GDP (excluding commodity service sector exports).

However, these estimates are not forecasts, because they are highly dependent on how we respond to the opportunity¹⁴. Indeed, Australia could do even better than this in the right circumstances because the volume growth opportunity is so large. This growth in exports can be supported by increasing investment as well as substantial value creation across a wide range of service sectors including construction and development, research and development, finance, professional services, education and others.

This Base Case has been compared with three other cases (see Box 3.1): the Do Nothing Case, the Low Case and the High Case.

- Under the Do Nothing Case, export revenues would be ~\$234 billion in 2030 in real 2010 dollar terms (Exhibit 3.2). The Base Case represents a cumulative increase of \$2.6 trillion in revenue over 20 years compared to the Do Nothing Case.
- In the Low Case Australia is not capitalising on the potential new projects that could go ahead. The export revenue in 2030 would be \$390 billion under this low scenario (Exhibit 3.2). This scenario would lead to cumulative export revenues of around \$1.6 trillion, which would be \$985 billion lower than under the Base Case, or worse.
- In the High Case, export revenue would be \$566 billion in 2030. Under this high scenario, cumulative export revenue could be almost \$3.14 trillion, or \$800 billion higher than the Base Case over the 20 years to 2030.

¹³ Total export value is modelled as total export revenues, or the value of free-on-board revenues, including rail and port costs.

¹⁴ Long-term prices are also uncertain, as we shall see. However, if prices are lower then the volume opportunity does not necessarily disappear. Indeed, it may become an imperative, to fill the gap created by lower prices.

Port Jackson Partners believes that this High Case is achievable – Australia does have the potential to increase share in some commodities beyond the current project pipeline, particularly coal, gas and iron ore, as well as some smaller sectors. However, doing so will require out-competing major players like Brazil, West Africa and India in iron ore, Indonesia, Mongolia, Columbia, Mozambique and South Africa in coal, and a whole range of current and potential players in gas.

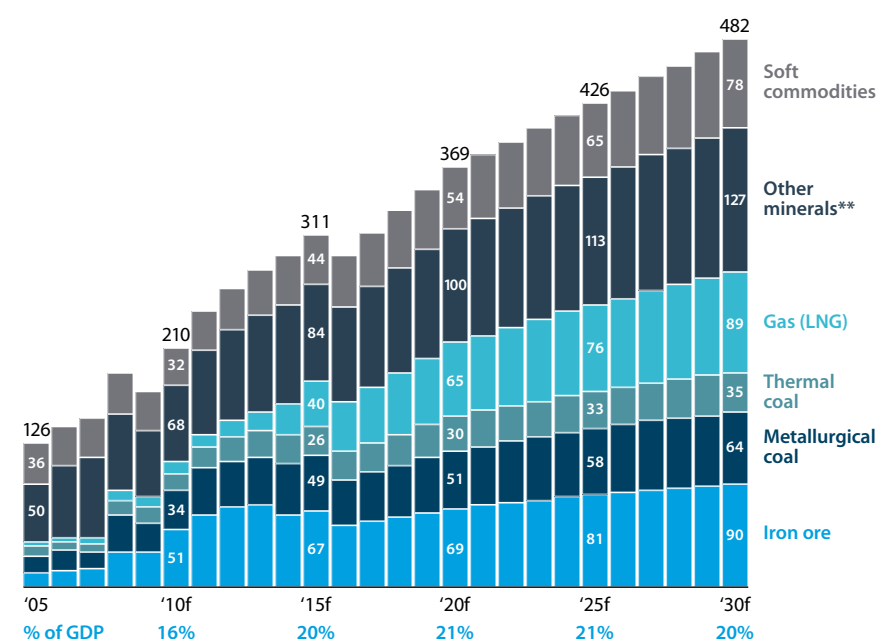
BOX 3.1 SCENARIO MODELLING: THE FOUR CASES

Case	Description	Market share assumptions	Exchange rate assumptions
Base Case	A realisable aspiration for Australia based on: – The forecast global growth of the commodity markets. – Australia's current market share. – Our current project pipeline. – Australia's resource constraints.	Unchanged market shares in each commodity once the current pipeline of projects is developed, except for: – LNG, where it is assumed Australia's share increases from 10% in 2010 to 27% in 2030, consistent with the large LNG projects currently under development. – Aluminium, where a decline in market share has been assumed, due to a lack of competitive advantage and high energy costs. – Other commodities where the reserve base is limited (especially gold and oil). For these commodities future growth is curbed to recognise the falling reserve base.	Based on the Bloomberg forward curve for US\$/A\$ exchange rates.
High Case	Australia achieves higher growth rates for each commodity than in the Base Case.	Increase in market shares across all commodities with sufficient reserves and low cost structures.	6 cents higher than the Base Case.
Low Case	Australia does not reach its potential growth rates in the export commodity markets and loses share to other players.	Loss of market share in each commodity while still achieving modest volume increases.	6 cents lower than the Base Case.
Do Nothing Case	No increase in volumes beyond capacity in place in 2010 (small volume increase over next two years as pre-built capacity comes on). A reference case only, not a likely outcome.	Flat export volumes imply declining market shares in each commodity over the period.	12 cents lower than the Base Case.

Exhibit 3.1

BASE CASE EXPORT REVENUE* IN COMMODITY MARKETS

(Real 2010 A\$ Billion pa)



* Export revenue is total export value, free-on-board.

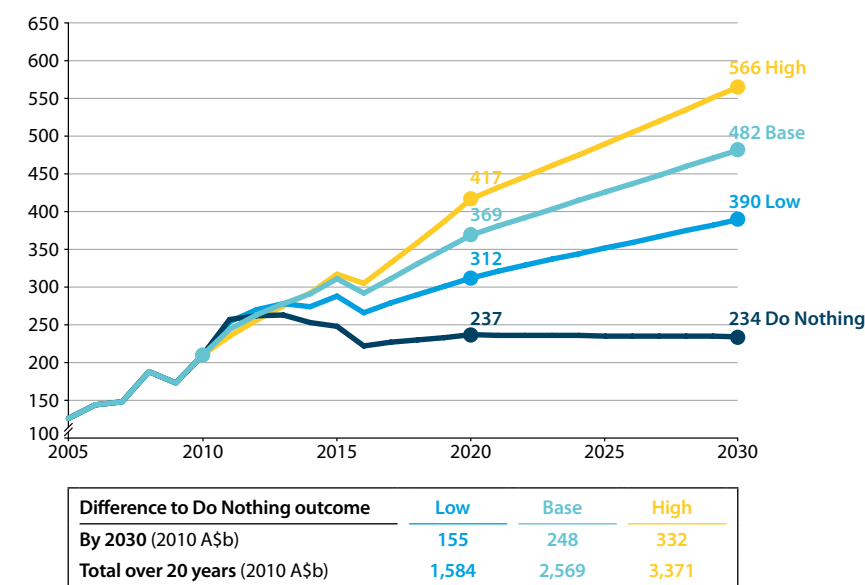
** Includes: Alumina, Aluminium, Nickel, Copper, Gold, Uranium, Crude Oil and other hard commodities.

Source: PJP analysis.

Exhibit 3.2

RANGE OF POSSIBLE EXPORT REVENUE* OUTCOMES IN COMMODITY MARKETS

(Real 2010 A\$ Billion pa)



* Export revenue is total export value, free-on-board.

Source: PJP analysis.

Around \$1.8 trillion in commodity related investment is required over the next 20 years to support the Base Case (Exhibit 3.3), equal to almost 50% of today's total Australian capital stock across all industries. Replacement and expansion capital for the mining industry are modelled to account for similar totals over the 20 years to 2030. Expansion investment requirements are \$820 billion over the period, while replacement capital investment is modelled at around \$770 billion. The pattern of investment is quite different, with high levels of expansion capital required in the first five to 10 years, and increasing levels of replacement capital over the period. In the Base Case, \$200 billion of investment is required to support soft commodity markets over this timeframe.

If Australia does better than the Base Case by capturing additional market share (the High Case), then around \$305 billion of additional capital investment would be required to support this additional production, a total of around \$2.1 trillion over the 20 year period (Exhibit 3.4). If Australia is slower to capitalise on the opportunity presented (the Low Case) then \$390 billion less capital may be required.

It is clear that there is a very large export and investment opportunity available to Australia in commodity markets¹⁵. By contrast, if Australia does not capture this opportunity, the combination of falling prices in key commodity markets and declining investment in Australia will significantly impact Australia's economic prospects over the medium to long term.

Exhibit 3.3

Period	Total - Soft commodities	Expansion - Mining	Replacement - Mining
'10-'	196	819	772
'30'	1,787	90	11

Chart Data (Estimated % of GDP):

Year	Replacement - Mining	Expansion - Mining	Total - Soft commodities
'05	27	8	34
'10f	18	39	65
'15f	30	44	83
'20f	39	31	79
'25f	45	29	84
'30f	51	29	90

Source: PJP analysis.

Exhibit 3.4

Gross investment (not net of imports)

2005 2010 2015 2020 2025 2030

104 High
90 Base
73 Low

91
79
65
26
25 Do Nothing

	Low	Base	High
Total '10-'30 (2010 A\$b)	1,398	1,787	2,093

- \$389b + \$306b

* Gross investment, not net of imports

Source: PJP analysis.



4.0 FAR-REACHING BENEFITS ACROSS THE ECONOMY

KEY THEMES:

- *The benefits of capturing the opportunity will be larger and more broadly based than just the direct impact from increased exports and investment.*
- *The sectors supporting the resource industries are large and growing, and their depth and breadth is not well understood.*
- *A significant proportion of Australian listed companies are already benefiting from exposure to the growing resources sectors.*
- *Growth in the service and supply sectors will boost jobs.*

4.1 THE RANGE OF POTENTIAL BENEFITS

It is commonplace to hear that the natural resources sectors, particularly mining, oil and gas, are not labour intensive, and that therefore the economic impact of their growth is not broad based. However, this report suggests that this is a narrow view of the benefits of capturing this opportunity.

First, the narrow view of benefits underestimates the importance of creating high productivity jobs. Workers employed by commodity exporters and their service providers deliver higher productivity than for the economy as a whole, partly because of the capital intensity of the investment needed.

Second, both the mining sector and the soft commodities sectors have large and fast growing support industries with firms spanning many sectors. Australia is well on the way to creating a globally competitive commodity support cluster covering a large range of skill sets. If this emerging cluster is encouraged, the potential economic benefit to Australia from future global demand for natural resources will be magnified.

Third, all Australians will benefit from the large increases in tax and royalty income associated with growth in these sectors, which have been significant in recent years and will continue to be significant. This report estimates that company taxes and royalties will rise by more than \$34 billion annually in the Base Case¹⁶, with a cumulative value of around \$945 billion over the period.

Fourth, the growth in commodity sectors and support industries will increase incomes, resulting in increased expenditure in other sectors, particularly in the domestic services sectors. These increases in income result from increased real wages and employment as well as increased investment incomes from growing profits. A significant proportion of the profit from these sectors either in dividends or capital gains is expected to flow back to Australian shareholders including superannuation funds, despite the fact that a portion of the new capital comes from offshore. This increase in incomes will, in turn, create new demand for domestic services unrelated to mining.

Finally, consumers and importers benefit from a stronger currency – it enables people to purchase more imported goods for less. This is equivalent to a pay rise for all Australians, reflected in cheaper purchases of imported goods. While a stronger exchange rate, increasing costs and higher interest rates (see Chapter 6) may create short-term pressures for import-competing businesses (including retail),

¹⁶ Excluding any mineral resource rent tax income.

the Australian consumer and those businesses with significant imports will benefit from the stronger Australian dollar and the overall benefits for the Australian economy have the potential to be large.

Even with some crowding out of other trade-exposed sectors, there is less cause for concern if the growth in the commodity and support sectors is sustained. The more sustainable the opportunity, the more it makes sense to build the economic capacity and/or reallocate economic resources to pursue the opportunity. As outlined earlier, the scale and duration of the market opportunity and the strength of Australia's resource base means that capturing a sustainable opportunity is possible.

4.2 THE HIDDEN OPPORTUNITY IN DOMESTIC AND EXPORT SERVICES

The growth of domestic and export support sectors on the back of commodity industry growth is an important and untold story in the Australian economy. Direct and indirect service providers are a critical part of the picture.

The growth of this sector is driven by both domestic resource growth and by Australian commodity producers who are expanding offshore. Given the right policy settings, the opportunity for the service cluster may prove to be larger than the underlying commodity sector growth. But the importance of the commodity industry support sectors is not widely understood.

- Many of the support services businesses are 'buried' in larger businesses, so that organisations which appear to lack any exposure to commodity sectors may have a substantial business unit with exposure to these sectors.
- Many of the faster growing players in the services sector are still private. Most have come only recently from modest beginnings and have not needed external equity capital to support their growth (at least until now). Their focus on services has meant that many of these companies have not needed to go to the capital markets to support growth.

The commodity sectors directly employ around 450,000 full-time employees and the immediate supporting service and supply sectors employ another 240,000 or more, totalling around 700,000 (Exhibit 4.1). The support sectors have revenues of around \$90 billion, industry value add of \$32 billion and profit of around \$13 billion, even before we account for commodity related services in financial, energy, water and many professional services sectors (Exhibit 2.2)¹⁷.

The breadth of the commodity-exposed sectors can be assessed by analysing all ASX listed companies in three groups.

1. **Focused Players** – this includes miners, oil and gas producers, agricultural producers and their focused service and supply providers (companies with a strong focus on serving these sectors.)
2. **Bystanders** – this covers companies that have no direct exposure to commodity sectors, although in many cases they may have exposure to regions in which commodity driven growth is strong.
3. **Two-Speed Companies** – these companies are a mix of the two, with some business units or key customer segments with direct exposure to the commodity sectors and some without any exposure. As a result, they are often characterised by having one very fast growing part of their business, and a second part of their business which is flat or in decline.

¹⁷ This analysis does not consider the employees whose work is focused on natural resource sectors, but who are employed in companies that don't characteristically focus on these sectors. For instance, a growing proportion of professional services work is focused on natural resource sectors, but these people are not included in these supporting sector numbers.

Almost 70% of the total value of the ASX is comprised of businesses with complete or partial participation in commodities or supporting services (Exhibit 4.2). This result is replicated if only the top 150 companies are considered. Commodity producers and their direct service providers (Focused Players) make up around 47% of the value of the total ASX market capitalisation (excluding Real Estate Investment Trusts and asset management stocks) and have 27% of revenue. These figures, in themselves, are astonishing and demonstrate just how far the economy has already shifted towards natural resource and soft commodity sectors. Two-Speed Companies represent another 22% of ASX market capitalisation, and have 22% of revenue. This cohort includes selected construction companies, financiers and diversified industrials and manufacturers, amongst others. This group includes many companies not typically considered to have mining or mining services businesses. A good example is OneSteel, which is traditionally seen to be an Australian steel manufacturer and distributor, but has an important iron ore mining business as well as a fast growing mining supply business.

Many of the service providers are growing quickly, globally as well as domestically (Exhibit 4.3). Indeed, 17 of the top 150 ASX-listed companies have very substantial direct mining service operations, while 30 are direct participants in commodity sectors, both in Australia and offshore. The focused service company group have a combined market capitalisation of more than \$70 billion, with an increasing proportion of their revenues coming from exports. As well as the larger listed companies there is a growing list of smaller listed specialist companies. A recent report identified 62 listed small market capitalisation¹⁸ stocks focused on mining services¹⁹.

Important examples of larger mining service providers include (see also Exhibit 4.3):

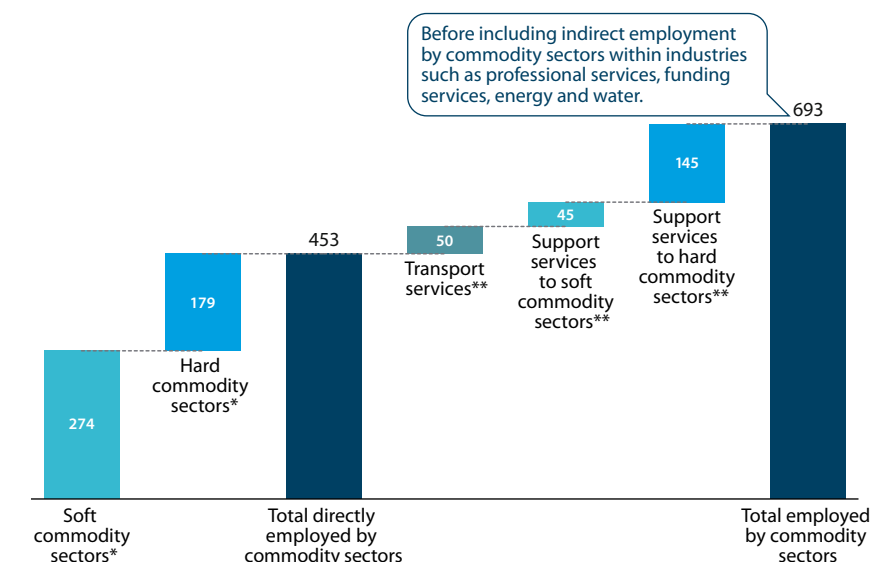
- Orica (market capitalisation of \$10 billion and financial year 2010 revenue of \$5.8 billion) supplies explosives to miners across the world, growing revenues at 15% per annum and profits at 18% per annum over the last nine years, prior to the GFC.
- Incitec Pivot (market capitalisation of \$7.5 billion and financial year 2010 revenue of \$2.9 billion) supplies explosives and fertilizer products to the mining and agriculture markets from more than 20 manufacturing plants across Australasia and North America, growing revenues at 28% per annum from 2002 (a year prior to merger of Incitec Fertilizers and Pivot) to 2009 and profits at around 50% per annum over the same time period.
- Worley Parsons (market capitalisation of \$6.9 billion and financial year 2010 revenue of \$5.1 billion) provides engineering, procurement and construction management services to the energy, resource and complex process industries across 40 countries globally, with profit and revenue growth of around 55% per annum from 2002 (year that Worley listed on the ASX) to 2009 (pre-GFC).
- Leighton Holdings (market capitalisation of \$9.3 billion and financial year 2010 revenue of \$14.6 billion) is the world's largest contract miner, as well as having a large project development business that extends into mining. It has grown revenues and profits at around 15% per annum over the past decade, and has contract mining operations throughout Asia and the Pacific.
- Campbell Brothers (market capitalisation of \$2.7 billion and financial year 2011 revenue of \$1.1 billion) is a diversified industrial services provider of mineral and environmental testing services operating across 44 countries around the globe, with around 50% of its revenues directly driven by the minerals industries. Over the past nine years (pre-GFC), Campbell Brothers has grown revenues at 15% per annum and profits at 26% per annum.

¹⁸ Not in the ASX100.

¹⁹ J.P. Morgan 'Small Cap Mining Services', May 2011.

Exhibit 4.1

ESTIMATED NUMBER OF EMPLOYEES IN SELECTED COMMODITY SECTORS (Thousands FTEs)



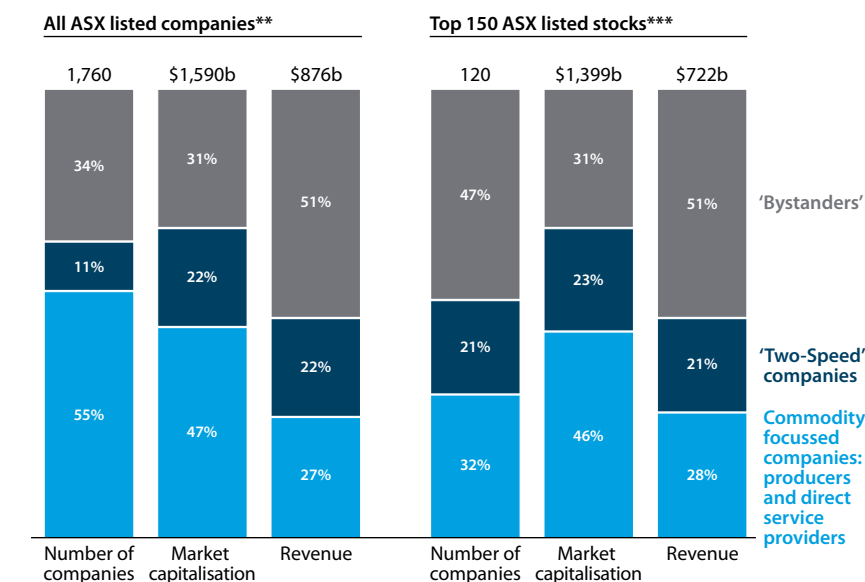
* ABS Nov 2010 actuals of total number of people employed adjusted to FTE equivalent.

** Total number of employees in service sector scaled by proportion of revenues attributable to commodities and converted to FTE equivalent (if part-time proportion of the workforce is low, less than 10%, assumed all full-time).

Source: ABS Labour Statistics, Nov 2010; IBISWorld Industry Reports, 2010; PJP analysis.

Exhibit 4.2

ASX LISTED COMPANIES*: COMMODITY FOCUSED, TWO-SPEED & BYSTANDERS



* BHP Billiton and Rio Tinto are included at their total (dual listed) market capitalisation and revenues.

** Excludes REITs and asset management/custody bank stocks (186 stocks with market capitalisation of \$289 billion).

*** Excludes REITs and asset management/custody bank stocks (30 stocks with market capitalisation of \$263 billion).

Source: Capital IQ, data as at 9 June 2011, PJP analysis.

Only 31% of the value of the ASX has no significant exposure to these industries. This includes many companies that do have some kind of regional exposure to commodity sectors, such as building material companies and property developers with businesses in fast growing regions such as Western Australia, the Hunter Valley in New South Wales and the Bowen Basin in Queensland.

4.3 SIGNIFICANT JOB CREATION POTENTIAL ACROSS A BROAD RANGE OF SKILL SETS

These service and supply sectors have been growing fast in recent years, and with a supportive environment they are expected to enjoy strong growth in the future. These supporting industries magnify the strength of the natural resource sectors within the Australian economy. The Australian component of their businesses will grow to around \$200 billion by 2030 in our Base Case, and by much more if we include some of the activities undertaken in companies with a broader focus. Under this scenario, we estimate that the number of full-time employees directly participating in the growth of the commodity sectors could double to around 1.5 million by 2030 (Exhibit 4.4), depending on the extent of productivity gains.

In all likelihood, the service sectors supporting the Australian commodity export sectors will grow faster in percentage terms than the underlying commodity sectors and faster than these figures suggest. The level of employment associated with investment and new projects is not well understood, but Port Jackson Partners' research indicates the labour requirements will be higher than currently estimated. Apart from the fact that these figures understate the number of people participating in commodity sector services, it is likely there will be rapid growth in the exports of services to other producer countries.

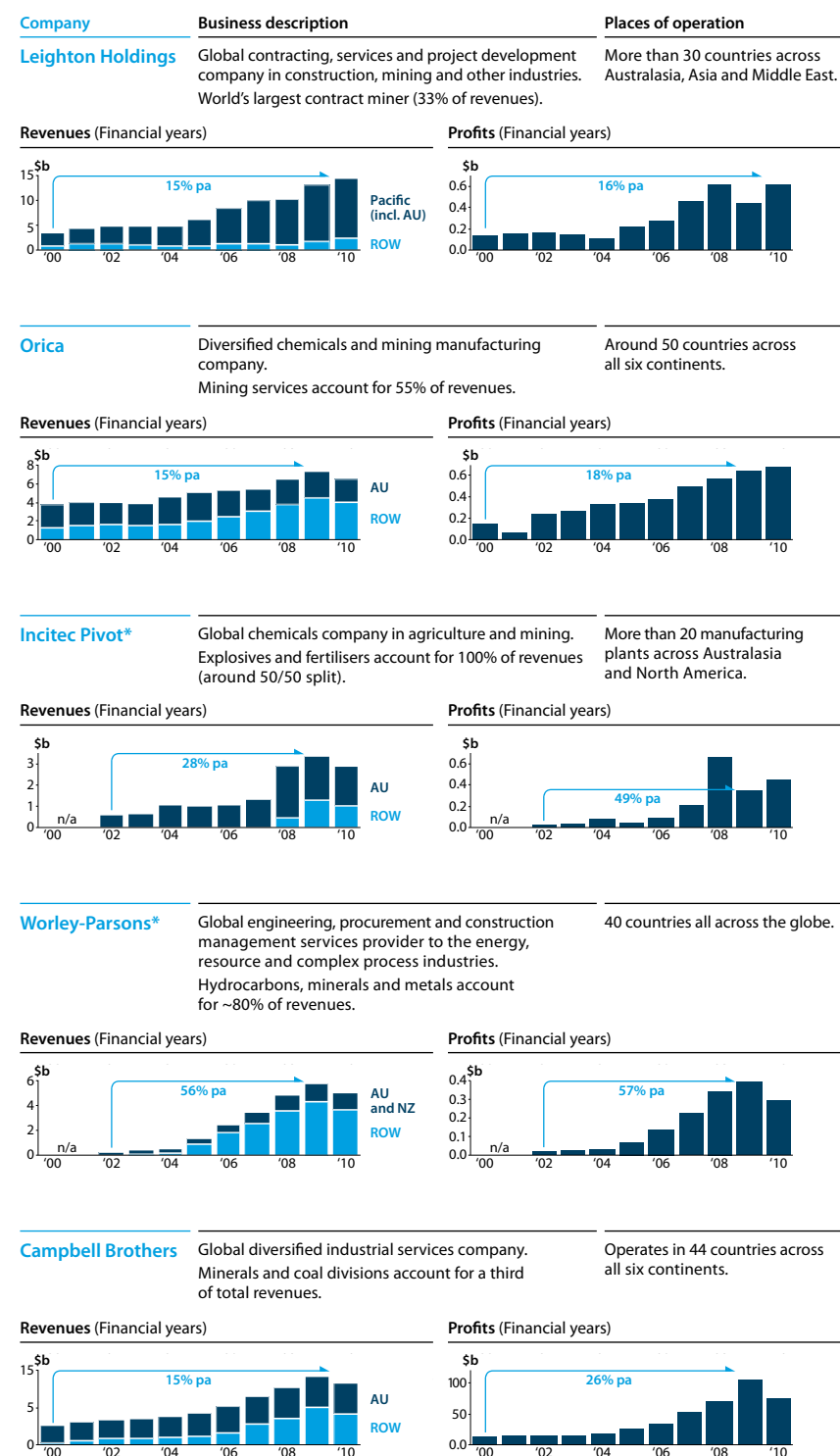
The supporting service and supply sectors cover a broad range of activities and companies, including contract mining, engineering services, explosives and consumables manufacturing, fertiliser and pesticide manufacturing, freight transport (rail, truck and sea freight), information technology and technology R&D. Exhibit 4.5 presents a sample of listed companies directly focused on the mining services sectors, showing the breadth of skills involved.

Benefits also flow to more generic services such as education, finance, accounting and legal services. Likewise, banks, accountants and consultants have developed extensive practices supporting mining, energy and agriculture companies, and they follow those companies as they expand globally. Australia also has institutions such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and universities which can expand their role in supporting the natural resource industries. There is an increasing global interest in Australian expertise in these areas.

Many of these listed and private companies are extraordinary Australian success stories, built from Australia's strengths as a natural resource rich country. Economist Michael Porter has argued for many years that clusters of internationally competitive firms can develop around dynamic, internationally competitive export focused industries (see Box 4.1). As the surge in demand for commodities continues and the emphasis shifts to competition for growth (as against watching prices go up), these companies, and others like them, will be well positioned to grow rapidly. Indeed, the management and board composition of many of the resource juniors in Africa and Asia show that many Australians are playing leadership roles in capturing this opportunity around the world, not just in Australia.

Exhibit 4.3

COMMODITY SERVICES PROVIDERS – EXAMPLES



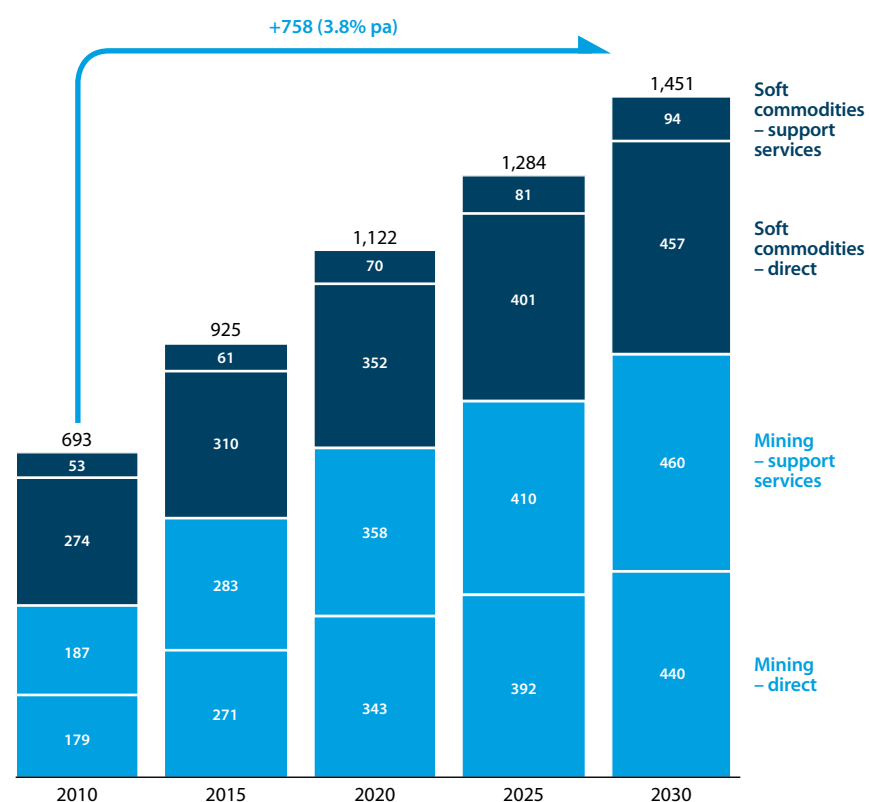
* Incitec Pivot was created through merger of Incitec Fertilizers and Pivot in 2003 (results prior to FY02 not available). WorleyParsons results FY02-05 represent Worley only, prior to acquisition of Parsons in 2004 (Worley listed in 2002).

Source: Company websites; Company annual reports and investor presentations; Bloomberg.

Exhibit 4.4

BASE CASE EMPLOYMENT REQUIREMENTS IN COMMODITY SECTORS*

(Thousand FTEs)

**Productivity improvement employment dividend**

Annual productivity gain	0.5%	1.0%	1.5%
Reduction in employment requirements	138	262	374

* Assumes zero labour productivity gains. Does not include professional services, funding services, energy and water sectors as it is very difficult to estimate the commodity driven proportion of the sector with a reasonable level of accuracy.

Source: ABS Labour Statistics, Nov 2010; IBISWorld Industry Reports, 2010; PJP analysis.

Exhibit 4.5

SPECIALIST MINING SERVICES COMPANIES – ASX LISTED

Category	Annualised revenue*	Example companies
Mining contractors	\$16.5b	Leighton, Transfield Services, Downer, Macmahon
Construction	\$13.7b	Leighton, Mondelphous, Watpac, Clough
Consumables	\$13.2b	Orica, Westrac, Incitec Pivot, Onesteel (consumables only)
Consulting & process engineering	\$8.3b	Worley Parsons, Cardno, Coffey, Ausenco
Logistic suppliers	\$8.1b	QR National, Toll Holdings, Asciano, K&S
Rail equipment & infrastructure	\$5.0b	Downer, UGL, Bradken, Engenco
Labour hire	\$4.3b	Skilled Group, Programmed Group, Humanis
Electrical contractors	\$2.8b	Hastie Group, Norfolk, Southern Cross Electrical
Utilities	\$2.6b	Duet Group, APA Group, Envestra
Drillers	\$2.5b	Boart Longyear, Ausdrill, AJ Lucas, Swick
Equipment Hire	\$2.1b	Coates Hire, Emeco, Boom Logistics
Specialist equipment	\$1.3b	Boart Longyear, Ludowici, Imdex
Fabricators	\$1.1b	RCR, AusGroup (SGX listed), Austin Engineering
Testing services	\$1.1b	Campbell Brothers
Remote Housing	\$938m	Decmil, Fleetwood, Nomad
Mining software	\$878m	Data 3, Runge, ISS Group
Recycling/ waste management	\$476m	CMA Corp, Tox Free, Electrometals Technology
Financial Services	\$468m	Wilson HTM Financial Group, Bell Financial Group, Euroz, Austock Group
Other	\$122m	Greencap, Aspermont, Environment Group, Clean TeQ

Total annualised revenue* = \$85 billion

* Based on most recently available half yearly revenue in \$A for listed companies with mining services revenue. Where possible, revenue has been allocated by category and non-mining services revenue has been deducted.
Source: PJP analysis.

BOX 4.1 DEVELOPING A GLOBALLY COMPETITIVE COMMODITY SERVICES CLUSTER

Michael Porter has argued that clusters of internationally competitive firms can develop around dynamic export focused industries²⁰. Clusters are groups of interconnected firms, suppliers, related industries and institutions which can arise in particular locations. Porter suggests that there are four key factors which together can influence a country's competitiveness in a given sector. These factors are: demand conditions, factor conditions, the context for firm strategy and rivalry, and the presence of related and supporting industries.

Australia is arguably on the way to meeting the conditions for developing a world class natural resource-based cluster. First, Australia has a world class, highly demanding and sophisticated set of global customers for our natural resources. Natural resource companies, in turn, represent a world class, highly sophisticated set of customers for these service industries.

Second, Australia has a rich base of natural resources to underpin its natural resource industries. While these provide a base, on their own they do not guarantee sustained competitive advantage. Instead, it is factors such as a skilled workforce, infrastructure and capital which create longer term competitive advantage.

Third, Australia has the sophisticated governance systems and a strong legal system required to manage how companies are created, organised and managed, as well as the competitive legal frameworks to ensure companies must compete actively with each other. This drives innovation.

Fourth, Australia has a large and growing set of related and supporting industries. As already outlined, these service sectors cover a broad range of activities and companies.

The strength of Australian natural resource industries has meant that many of these service providers have developed successful global strategies, and are growing rapidly on the back of their global businesses. Australian natural resource players are increasingly outsourcing specialist skills to dedicated suppliers. These organisations are following their customers offshore and are now exporting their expertise to the world.

This process of fast-growing, internationally-competitive, resource-based industries creating clusters of fast-growing suppliers and service providers is not new. Texas, in the United States, built an oil and gas services industry on the back of its oil reserves. Israel has built an irrigation industry on the back of its need to drive water efficiencies. What is new is the prospect that due to improvements in communication technologies, these Australian organisations may be able to develop a global critical mass necessary to lead in their niches, far faster than the historical experience.

²⁰ *The Competitive Advantage of Nations*, Michael E. Porter, The Free Press, 1990. See also 'Creating Shared Value', by Michael E. Porter and Mark R. Kramer, Harvard Business Review, February 2011.

5.0 CAPTURING THE OPPORTUNITY – THE CHALLENGES

KEY THEMES:

- *Australia has a good starting position to capture this opportunity, based on location, natural resource endowment and skills.*
- *There are well matched and well-endowed global competitors to all of Australia's mining, energy and agricultural sectors.*
- *Australia's ability to capture share of this opportunity will depend on its continuing ability to encourage and attract investment even in the face of market volatility.*

Australia is well positioned to capitalise on the sustained growth in demand for commodities over an extended period of time.

- It is located close to the fastest growing markets, which is a big advantage for bulk commodities and building customer relationships.
- It has enough resources to supply the growth in demand for many years.
- It has a strong history of successful growth in commodity industries.

At the same time, Australia does not have a monopoly on the resources which the developing world will want, and the low-cost positions to support that demand. Competition from other countries will be ferocious. Australia must position itself thoughtfully and energetically to capture this opportunity.

5.1 NO MONOPOLY ON HIGH QUALITY MINERAL AND ENERGY RESOURCES

While Australia has a large body of natural resources relative to the size of its economy, the reserves make up only a relatively small proportion of the world's mineral and energy reserves, even in those commodities where Australia currently has significant market shares.

For example, Australia currently contributes 25% of world iron ore production, but has 17% of known reserves²¹. Australia's current production share is also higher than its reserve share for bauxite, iron ore, Liquefied Natural Gas (LNG) and metallurgical (coking) coal. By contrast, Australia is producing less than its reserve share for uranium, nickel and gold. There are more than 50 years of world reserves of many minerals at current levels of production and even larger levels of reserves for bauxite, thermal coal and iron ore (119, 110 and 86 years respectively)²².

5.2 AUSTRALIA'S LOW COST MINERAL AND ENERGY POSITIONS ARE NOT UNIQUE

It is sometimes argued that despite the global abundance of natural resources relative to demand, much of this is low quality, whereas Australia is uniquely positioned with abundant high-quality reserves and resources²³ adjacent to fast growing markets. While these things are advantages relative to some competitors, Australia does not have unique delivered-cost positions. Many countries have large resources and reserves of mineral and energy commodities (Exhibit 5.1), and some of these countries are major customers themselves (e.g. China for thermal coal, India for iron ore).

²¹ A 'reserve' is a quantity of material considered to be economically feasible for extraction.

²² It is often argued that the world is running out of oil – the 'peak oil' thesis. For oil, this may be true using conventional resource definitions, but it is clearly not true if non-conventional reserves, such as shale oil and gas to liquids are included. The issue is simply one of economics – the non-conventional sources of oil are more expensive.

²³ A 'resource' is a quantity of material where there are reasonable prospects for eventual economic extraction. A 'reserve' is the economically mineable part of a mineral resource. Reserves are therefore a subset of resources.

Iron Ore

In iron ore, Australia will compete for future opportunities with several major low-cost producers. Brazil, Guinea in West Africa and possibly also India combined have more than enough resources to take all of the future growth. While Australia has a geographic advantage over Brazil and Guinea, these two producers have significant quality advantages. Brazil, in particular, is alleviating its geographic disadvantages with massive new low-cost ships and related port facilities. Indian iron ore producers have the enormous advantage of being adjacent to a large growing source of demand, with reasonable quality ore. The key issue for India is overcoming supply chain and planning issues.

Coal

In coal, Australia will compete for share with a range of other low-cost producers in Indonesia (thermal), Columbia (thermal), South Africa (thermal), Mozambique (metallurgical and thermal), Mongolia (metallurgical and thermal) and India (thermal), as well as interior provinces in China (metallurgical and thermal). Australia's thermal coal is generally of reasonable quality and it is relatively close to the relevant markets, but again, there is no cost advantage large enough to assure growth in share. Australia faces some challenges in its supply chains due to fragmented ownership of port, rail and mine facilities, and emerging local community concern over further mine developments, particularly in the Hunter Valley of New South Wales and around Sydney.

Seaborne Liquefied Natural Gas Market

The seaborne LNG market is relatively new, and the competitive landscape is still unfolding. It is clear that Australia will compete hard with other producers to its north (such as Papua New Guinea), the Middle East, domestic production in major customer countries (especially non-conventional gas in China) as well as North America, which is beginning to export into Asian markets.

Aluminium and Alumina

Aluminium and alumina production in Australia is now at a clear competitive disadvantage and we have reflected this in our Base Case. China has proven its ability to develop smelting and refining capacity at a lower cost than Australian capacity, and Australia has no real advantage in energy costs – the critical input into aluminium smelting and an important input in alumina refining.

Other Sectors

In other sectors, Australia's position is mixed. In oil, its resources are quickly running down. In copper, it is highly reliant on expansions at Olympic Dam in South Australia. In gold, Australia's cost structures have been rising rapidly and its reserve base is dwindling. In uranium, it is reliant on politically difficult expansions (e.g. Jabiluka in the Northern Territory).

Beyond Australia, there is increasing recognition of the scale of the global transformation, creating new competitors.

Australia has been privileged in its ability to attract global capital for resource developments, but countries in Africa, Asia and South America are currently working hard to improve their positioning. In the meantime, the Chinese Government is demonstrating its willingness to support new projects all around the world²⁴.

Most of Australia's strong competitors are showing their willingness to attract foreign investment and skills to encourage economic growth. Guinea, Mongolia and Mozambique have strongly encouraged a broad range of foreign interests (including Australian companies) to bring skills and financial muscle to bear on their resources. They are offering strong incentives to fast-track this investment, both positive (such as tax holidays) and negative ('use it or lose it').

²⁴ Scissors D., "China Global Investment Tracker: 2011", The Heritage Foundation, 10th January 2011.

Exhibit 5.1

THE COMPETITIVE LANDSCAPE

	Current annual global exports	Critical competitors to Australia	
		Top tier competitors	Second tier competitors
Iron ore	950 mt (2009)	Brazil (Vale) – 16 Bt reserves Guinea (various) – 2 Bt resources*	China – 13 Bt reserves** India – 7 Bt reserves
Coal – Thermal – Coking (metallurgical)	Thermal: 725 mt (2009) Metallurgical: 207 mt (2009)	Thermal – Indonesia (4 Bt reserves), Columbia (7 Bt reserves), South Africa (30 Bt reserves) Metallurgical – North America (2 Bt reserves), Mozambique (~11 Bt resources), Mongolia (7+ Bt reserves)	Metallurgical – China (34 Bt reserves), Commonwealth of Independent States (8 Bt reserves), Europe (2 Bt reserves)
Gas - LNG	243 bcm (2009)	Papua New Guinea (0.4 tcm reserves), Indonesia (3.2 tcm reserves), Middle East (76 tcm reserves)	China (2.5 tcm reserves)
Other minerals e.g. – Copper – Bauxite	Copper: 15.8Mt (2009) Bauxite: 193mt (2009)	Copper – Chile (>300 Mt reserves), Democratic Republic of Congo (>50Mt reserves) Bauxite – Guinea (7.4 Bt reserves), Vietnam (2.1 Bt reserves)	
Soft commodities e.g. – Grains – Livestock		Brazil Eastern Europe (e.g. Ukraine) Other Central and South America	Productivity gains from traditional producers (e.g. Europe, North America) Africa?
Service providers		South Africa North America	United Kingdom Singapore/ Hong Kong

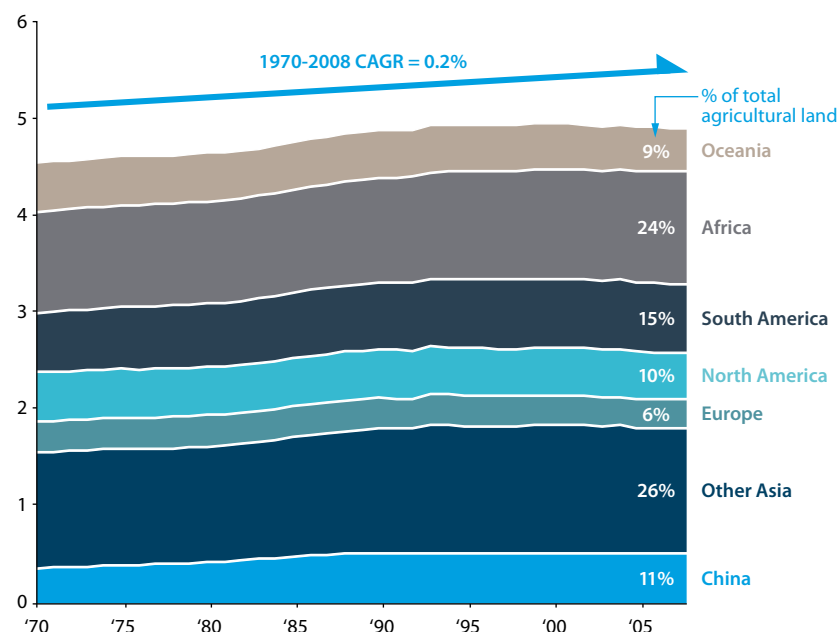
* Guinea's iron ore is not declared as reserves.

** Fe content adjusted.

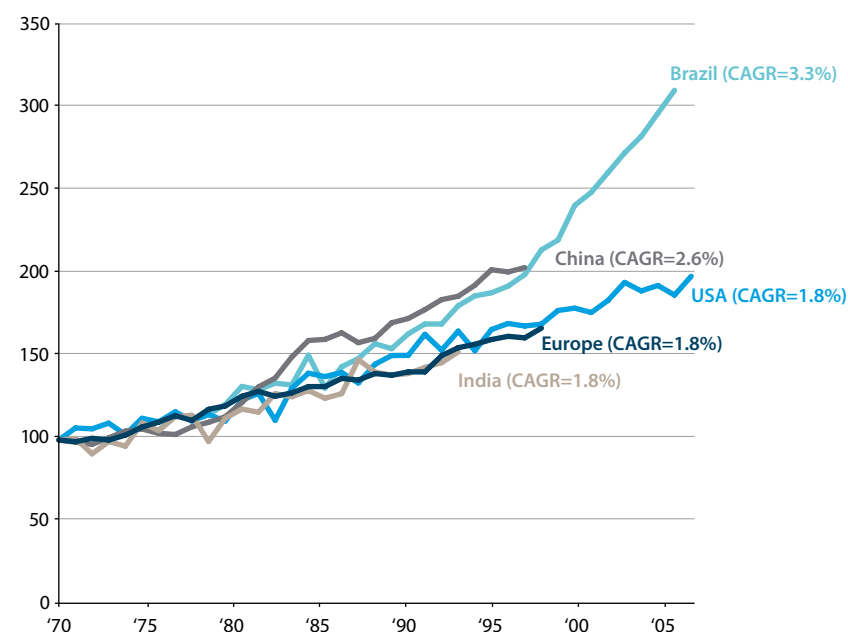
Source: USGS, 2010, 2011; ABARE Australian Energy Resource Assessment, 2010; Raw Material Group, 2009; BP Statistical Review of World Energy 2010; ABARE Commodity Statistics, 2010; Rio Tinto Annual Report; Tavan Tolgoi Website, 2010.

Exhibit 5.2
GLOBAL DRIVERS FOR AGRICULTURAL OUTPUT

Global agricultural land availability (Million hectares)



Agricultural total factor productivity (Index 1970 = 100)



Source: IFA; US Department of Agriculture Economic Research Service.

The question is: can Australia win its share of new projects?

There is no inevitability about Australia attracting these large-scale projects. As other regions and countries start developing environments that are actively supportive of investors, timely, high quality projects will be the real source of scarcity in global markets, not the mineral resources. This means that Australia must compete on project quality and timing to take market share from these competitors.

5.3 AN INTENSELY COMPETITIVE LANDSCAPE IN AGRICULTURE

Australia can also expect intense competition in the agricultural sector. Competition will be focused on the development and application of new practices and technologies, more than bringing on new land or water. The amount of land available for global agriculture has grown at just 0.2% per annum during the past 40 years (Exhibit 5.2). There are also limits on the amount of water available for agricultural use globally. Increased agricultural output has been driven by increases in agricultural productivity over that period, not by increases in land or water availability (Exhibit 5.2). Australia's agricultural productivity is relatively high, so further growth will be in competition with countries which start from a low base, with relatively easy gains. Critical competitors will include South America (particularly Brazil), Eastern Europe (e.g. the Ukraine) and parts of Africa (e.g. Sudan).

Australia's task is to continue to tap into new technologies and practices to increase its farm output. It is important to note that the developing world is able to become more productive and competitive in this area by catching up on existing best practice – the gap between the best and worst performers in agriculture is large enough to deliver enormous productivity gains for many years to come. This offers a particularly big opportunity to relatively low productivity developing countries, such as parts of South America, the Commonwealth of Independent States and Africa. Australia (and to a large degree the rest of the developed world²⁵) does not have this relatively easy path to improved productivity and competitiveness and so must focus on new technologies to maintain or improve its global position.

Innovations in agriculture can increase productivity, for example, by improving yields, increasing resistance to pests and diseases, reducing the need for fertilisers and other inputs and increasing tolerance for environmental stresses such as drought or frost. Historically the clover pasture revolution alongside increased application in fertiliser ('super and sub') resulted in massive increases in agricultural productivity. This process has largely run its course, but new technologies can provide the next wave of productivity gains. Australia has successfully brought new crops into production in the past (e.g. genetically modified cotton and canola)²⁶, and there are numerous biotechnology innovations in the pipeline. Australia's ability to develop and willingness to initiate R&D as well as adopt new technologies, given these matters are still subject to public debate, will determine its potential to compete in this area.

Australia may also have the advantage (along with a limited number of other regions in the world), of being able to bring some additional land and water into production. For instance, Northern Australia has abundant water available that could be used to increase Australia's agricultural production²⁷. While this could provide a one-off increase, technology will provide continuing improvement to productivity.

²⁵ The exception to this is the lost productivity from protection of agricultural sectors, particularly in the US and Europe.

²⁶ Australian Bureau of Rural Sciences, "Science for Decision Makers", December 2009.

²⁷ Although see "Sustainable development of northern Australia", Northern Australia Sustainable Development Task Force, February 2009, which argues that there is little potential in Northern Australia.

5.4 SEEING THROUGH THE VOLATILITY

This shift to volume growth (rather than price increases) as a recognized source of opportunity will create a new dynamic. The global race to bring on new supply to meet demand growth will be intense, only tempered by the scale of the risks involved.

While the transformation of the developing world will continue to drive sustained demand growth in natural resources, this demand growth may not be smooth. Most industries are working at the steep end of their supply curves, which means that small mismatches between supply and demand can have large effects on price. The chance of continual mismatches between supply and demand is high. Australia should therefore prepare for sustained volatility.

It was evident during the GFC that a number of players reacted when prices temporarily dropped and financial conditions tightened. The most successful competitors during that time period held their nerve, keeping an eye to the fundamental drivers of demand, and the longer-term opportunities that they create. The volatility and uncertainty of the new environment may create discomfort for governments.

Export price volatility will need to be well managed to avoid causing uncertainty in domestic employment, activity and investment.

5.5 MANAGING THE RISK OF CROWDING OUT

Without significant new economic capacity, there is a risk that non-resource sectors of the economy, including domestic (non-resource oriented) manufacturing, are crowded out by the movement of labour and capital toward capital-intensive natural resource sectors and, in places, by a stronger Australian dollar. This risk would see the benefits of resource sector volume growth being restricted to a smaller proportion of the Australian economy than is otherwise necessary. This is covered in more detail in the next chapter.

6.0 MAXIMISING BENEFITS THROUGH A WHOLE-OF-ECONOMY APPROACH

KEY THEMES:

- *Capturing the full potential of the opportunity requires a coordinated whole-of-economy approach to address potential supply-side bottlenecks.*
- *Success will require the formation of new economic capacity.*
- *Potential challenges include:*
 - *Crowding out non-commodity export and import competing activity that would otherwise prosper – the debate over ‘winners and losers.’*
 - *Missing the full potential of the opportunity as Australian commodity producers compete with each other for scarce resources.*

Many argue that the risk of crowding out or the ‘resource curse’ demands caution. According to this view, rapid growth in capital intensive natural resources sectors crowds out other sectors (particularly manufacturing) and risks the creation of a two-speed economy with disproportionate benefits accruing to capital rather than labour²⁸. This chapter develops a framework for thinking about crowding out in the economy, arguing that a coordinated response across all governments, business and the community can minimise the impacts, and capture a disproportionate share of the prize for Australia.

6.1 SHIFTING THE POLICY RESPONSE TOWARD NEW ECONOMIC CAPACITY

The Australian Government Treasury has acknowledged that the impact of the commodity export opportunity is heavily dependent on policy settings²⁹. The rapid growth in economic activity to support increased commodity production and investment can be managed in a range of ways.

1. **Slow growth.** This means discouraging the pace of development of Australian commodity industries to moderate crowding out and the development of a multi-speed economy. The rationale for this is to soften the impact of the reallocation of income and resources driven by such a significant structural change³⁰.
2. **Reallocate and redistribute.** This option involves allowing business and markets to reallocate labour, capital, technology and land access whilst ‘compensating’ those who suffer as a result. It is essentially the default option which comes about in the absence of capacity growth.

In this option, well-functioning markets for labour, capital, technology and land access will do this work. This reallocation of factors of production is reliant on a strategic response from business to price signals for the factors of production (e.g. higher wages, capital costs and land costs). Government’s only role is to make sure these markets are working properly, without distortions from Government policy or market failure³¹.

²⁸ “The Fiscal and Economic Outlook”, Ken Henry, 16 May 2006; “The Shape of Things to Come: Long Run Forces Affecting the Australian Economy in Coming Decades”, Ken Henry, 22 October 2009.

²⁹ See for example Ken Henry, 14 August 2006, “Economic policies to address global pressures”, Address to Australian Industry Group Annual National Forum, Canberra.

³⁰ Robert Gottlieb, “Deflating our mining expectations”, Business Spectator, 14 June 2011.

³¹ Usually this sort of encouragement is made necessary by regulatory rigidities in the first place, such as unemployment benefits for the unemployed who are not willing to move to find work.

This option may result in crowding out of trade exposed businesses outside of the commodity sector. Marginal opportunities and production in the commodity sectors may also suffer from crowding out. As a result, this option will inevitably lead to calls for a reallocation of wealth from those benefiting from growth, to those suffering. These transitional costs can be regional, or sector based, and facilitated through taxes or royalties. This was part of the rationale underpinning the original Resource Super Profit Tax when it was proposed in 2010³².

3. **Build capacity to enable growth.** This option involves encouraging the pace of growth in commodities and related services whilst also proactively limiting the impact on other sectors in two ways. First, the need to reallocate resources away from non-commodity industries can be reduced by adding supply-side capacity (skilled labour, capital, land access and technology) to help capture the opportunity. Second, capacity can be added by accelerating and streamlining development processes and enacting other supportive policies (e.g. less expansive fiscal policy, tax, encouragement of foreign investment).

Port Jackson Partners' analysis indicates that while there is clearly not a pure 'either/or' choice between these options (particularly between reallocation/redistribution and building capacity), a response that is biased toward adding to the capacity of the economy (option 3) has significant advantages over the other options.

BOX 6.1 THE GREGORY THESIS AND CROWDING OUT

The debate about crowding out is not new. In 1976, Robert Gregory put forward the thesis that growth in an export oriented sector had an impact on other export oriented and import competing sectors³³. The essence of the argument is that some combination of input inflation (particularly labour costs and interest rates) and appreciation of the exchange rate results in reduced competitiveness for sectors competing on international markets which do not have improved pricing prospects. This is particularly true of our non-resource manufacturing, tourism and tertiary education sectors.

Two points need to be made about the Gregory thesis and crowding out more generally.

First, in the original formulation Gregory was not arguing that the surge in growth of the minerals sector was 'bad', simply that it would result in significant restructuring of the economy. Second, Gregory's original formulation did not allow for the impact of a coordinated increase in the economic capacity of the country (through increased labour supply, sources of capital and total factor productivity). This is a critical point – the crowding out effect can be significantly alleviated if there is spare capacity or enough new economic capacity can be added.

Whatever our position on the Gregory thesis, it is clearly true that in the absence of significant adjustment, some of the benefits of rapid growth in commodity export revenues could be offset by losses elsewhere and there is a risk that benefits will be restricted to a smaller proportion of the economy than is necessary³⁴. Appropriate responses to add economic capacity have the potential to alleviate these pressures, and these responses are obvious themes for a broad national discussion.

6.2 REALISING THE OPPORTUNITY THROUGH A WHOLE-OF-ECONOMY RESPONSE

Enabling growth is best realised by a whole-of-economy response which must be considered in two ways. First, it is important not to focus on one part of the economy at the expense of the rest. Second, to achieve this would require a coordinated strategy across all levels of government, business and the broader community.

³² See Dennis Shanahan, 'The Australian', 1 May 2010: 'Rudd's reform push ends in political nightmare.' 'A growing resources sector will draw capital and workers to the mining states, increasing pressure on other industries and regions as they compete for employees and investment. . . Unless we recognise these challenges, Australia risks becoming a two-speed economy as the resources sector absorbs more capital and labour, while manufacturing and other industries suffer a relative decline in competitiveness.'

³³ RG Gregory, 'Some Implications for the Growth in the Mineral Sector', The Australian Journal of Agricultural Economics, Vol 20, number 2, August 1976.

³⁴ Indeed, the economist Ed Shann has pointed out that we may create a three track economy – resources (growing fast), non-traded services benefiting from higher incomes and other export and import competing sectors and services growing slowest due to competitive pressures. ('Leaders have lost their way on economic reform', Australian Financial Review, 5 January 2011).

For instance, just increasing the supply of skilled people to deliver and operate major new projects requires coordination across many different private and public sector organisations. A whole-of-economy response would require:

- Governments (State, Federal and even Local) to support the rapid growth of economic capacity - labour, finance, technology and productivity - use of land for development (mining or agricultural) and supporting policies in other areas (e.g. fiscal and monetary policy).
- Businesses that are willing to work with government to define exactly what is needed, and are able to develop the organisational capacity to deliver growth (including skills, processes, systems and so on).
- Communities aligned with the overall objective of rapid growth in commodity export capacity and all that entails (including land development, use of natural resources such as water, increasing workforce, accelerated use of new technologies).

It is overly simplistic to say that the market will, on its own, build the capacity to enable growth.

In order to realise the full potential of this opportunity while limiting the impact on non-resources sectors, Australia needs to create significant additional economic capacity in a short period of time. This may come from a combination of removing barriers and implementing new arrangements to build capacity. This will require the right workforce and capabilities, access to sufficient capital, easy access to the right technologies and accelerated land access. It will require a supportive political and macroeconomic environment, along with transparent and rapid approval processes and supportive environmental policies.

6.3 THE FOUR FACTOR INPUTS REQUIRED TO CREATE CAPACITY

There are four key factors of production which contribute to an economy: labour, capital, technology and natural resources. Australia has the opportunity to create and attract new capacity in all these areas to take advantage of the opportunity while minimising any downside risk to the economy. To add capacity in each of these areas will involve overcoming concerns about the unknown and about new ways of doing things including: immigration and changing work practices, foreign investment, new technology and changes in land use within local communities.

6.3.1 Establishing the labour force to deliver growth

Establishing a labour force with the capabilities and skills necessary to develop and operate these large new projects is a top priority. The recent rapid increase in the resource project pipeline illustrates that Australia has not needed a workforce of this scale in the past, particularly a workforce capable of executing a large number of mega projects in parallel. The establishment of such a workforce quickly can help to mitigate continued upward pressure on costs, and a potential loss of competitiveness. The question is, how do we increase the size of the skilled labour force necessary to meet the opportunity? (See Box 6.2)

6.3.2 Financing growth and the foreign ownership debate

In recent times Australia has engaged in vigorous debate about the sources of capital for natural resource investment, for example the proposed deal between Rio Tinto and Chinalco, a state-owned Chinese aluminium and mining company. More recently, foreign ownership of Australian farms has become an emotive issue³⁵. These debates are not new, for example the debate over Japanese investment in the 1970s and 1980s³⁶.

³⁵ For example, ABC News 'Selling the Farm', August 2010.

³⁶ For instance, the Sydney Morning Herald wrote during the 1980s: 'Japan's 20 biggest companies could buy the entire State of NSW using just one year's profits' – 23 May, 1987; "...the Japanese today have become what they call Japan Incorporated" – 17 July 1983. The Australian Financial Review wrote "the local community begins to feel foreigners [Japanese] are not playing fair and square". – 7 April 1988.

BOX 6.2 ESTABLISHING AN APPROPRIATE LABOUR FORCE – KEY ISSUES AND PERSPECTIVES

Key issues	Some perspectives and questions
What is the size and skill-set of the additional labour force necessary to capture this opportunity?	<p>At least 750,000 new jobs will be created over the full 20 years of the analysis, based on current production/labour ratios of these sectors. This estimate is likely to increase significantly as the labour requirements of new investment become clearer.</p> <p>The composition of the workforce is a key issue, not just the size.</p> <p>Possible sources of this workforce to consider include: immigration, retraining, increased participation rates, reduced unemployment and underemployment.</p>
How can Australia align education and training with the opportunity?	<p>This is an issue for the whole higher education sector, not just for technical education.</p> <p>How can the universities re-establish a focus in areas such as agronomy, geology, mining engineering and resource economics?</p> <p>How can universities and the private sector work together to educate the skilled people required?</p>
How can increased participation rates support the opportunity?	<p>What tax and welfare reforms may be required to increase participation?</p> <p>What changes might be needed to support an ageing workforce or one with higher female participation?</p>
How can Australia encourage the increased mobility necessary to support the opportunity?	<p>What labour market arrangements might be needed to attract skilled labour to remote projects without causing national wage pressure?</p> <p>How much of the remote workforce can be provided by fly-in-fly-out versus permanent relocation?</p>
What changes are necessary to Australia's industrial relations system to ensure this opportunity is not threatened by industrial disputation or growth in real wages ahead of productivity gains?	<p>During the 1970s and 1980s industrial disputes in the iron ore sector caused damage to Australia's reputation in Japan.</p> <p>Changes may be needed to ensure Australia can capture this opportunity ahead of our competitors.</p>
What are the strategic human resources implications for Australian businesses?	<p>Australian businesses may face a renewed 'war for talent'.</p> <p>What recruiting, development and retention strategies are required?</p> <p>What role is there for Government in accessing people from offshore?</p>

BOX 6.3 FINANCING THE OPPORTUNITY – KEY ISSUES AND PERSPECTIVES

Key issues	Some perspectives and questions
Where will the capital come from to support this growth?	<p>Global capital markets post-GFC are still taking shape, but new dynamics are emerging.</p> <p>Savings rates in the developed world have risen, but risk aversion has increased and leverage finance is out of fashion.</p> <p>Changing global demographics are expected to increase the costs of capital.</p>
How does Australia attract the required investment and avoid raising the cost of capital in Australia?	<p>How should Australia evaluate new sources such as foreign sovereign wealth funds?</p> <p>Should Australia consider encouraging higher levels of domestic savings to support commodities growth?</p> <p>How can Government use fiscal policy and tax policy to encourage savings and investment?</p>
Should Australia revisit its Foreign Investment Review processes?	<p>Is the balance right between attracting sufficient capital and protecting the national interest?</p> <p>How should we deal with capital closely tied to governments in customer markets?</p>
Is there a role for an Australian sovereign wealth fund to reinvest some of the fiscal returns from growth?	<p>Has the advantage of creating fiscal discipline.</p> <p>One key issue is whether such a fund should invest in longer run domestic assets that contribute to additional future capacity (e.g. infrastructure), versus making more traditional capital markets investments.</p>
What role can Australian banks and capital markets play in supporting this opportunity?	<p>The challenge for the banks is to finance the growth of the economy as well as the more traditional mortgage and consumer lending sectors.</p> <p>Does Australia have the depth of debt capital markets to support the growth of these sectors?</p>
How might Australia increase the level of investment in agriculture?	<p>Agriculture has traditionally self-financed its growth but this model may not be sustainable.</p> <p>Can new financing models such as equity partnerships and leasing emerge fast enough to support growth?</p>

Key issues	Some perspectives and questions
What has driven the slowdown of total factor productivity in Australia's natural resource industries and how can this be addressed?	<p>Some required breakthroughs could simply involve integrating existing technologies e.g. Rio Tinto's remote operations centre in Perth, which serves the Pilbara from over 1,500km away.</p> <p>Key questions include:</p> <ul style="list-style-type: none"> – Can Australia counter falling ore grades with better mining technologies such as automated vehicles or autonomous drills? – Could Australia address falling rates of productivity growth in agriculture with emerging biotechnology breakthroughs or better use of remote sensing and GPS technologies?
How might Australia re-establish its pre-eminent position in natural resource R&D, particularly for agriculture?	<p>Historically Australia led the world in R&D for commodity industries, particularly in agriculture.</p> <p>Could the CSIRO establish a new 'flagship' program, coordinating new investment in research in agriculture and mining productivity?</p>
How can Australia build new R&D partnerships with consumer countries (e.g. India and China)?	<p>Customer countries are increasingly interested in investing in R&D to improve access to resources.</p> <p>China and India are good candidates to work with Australia.</p>
How can Australia best facilitate the development of globally competitive service clusters in energy, mining and agriculture, supporting productivity gains in these sectors?	<p>Developing a globally competitive natural resource cluster should deliver accelerated productivity gains for commodity exporters. High levels of productivity are in fact central to the success of a cluster.</p>

Government can also play a role in facilitating investment. For example, reducing expansionary fiscal policy settings would reduce constraints on providing investment capital. Changes in taxation policy can also deter investment. One prevalent question is whether Australia should create a sovereign wealth fund, into which some of the returns from resource sector-driven growth are invested for the benefit of future generations. This is an important issue worthy of debate and that debate should include questions such as whether such a fund should be focused on domestic investment in long-run assets that contribute to future capacity creation (e.g. infrastructure), versus having a more traditional investment focus. Box 6.3 poses key questions related to financing the opportunity and offers perspectives on each.

6.3.3 Accelerating productivity: technology, innovation and R&D

Australia's rate of growth of total factor productivity has slowed in recent years, and natural resource sectors are no exception³⁷. In fact, multifactor productivity has declined since 2003-04 after a rapid surge during the 1990s, which has partially offset productivity improvements arising from 'capital deepening' (i.e. increases in the capital to labour ratio)³⁸. Today, Australia faces an increasing need to

³⁷ 'Australia's Productivity Performance', Saul Eslake, Seminar Presentation to Australian Treasury, September 2010.

³⁸ 'Sustaining Growth in Living Standards in the Asian Century', Dr Martin Parkinson, Gala Address to the Melbourne Institute Economic and Social Outlook Conference, June 2011.

re-establish the productivity gains of the 1990s. In minerals and energy, despite relatively high quality resources, Australia faces ongoing grade declines in some regions. Combined with significant workforce requirements, productivity is critical to realising the full potential of the growth opportunity.

In the case of agriculture, most volume increases have always come from productivity gains, driven by new practices and emerging technologies. It is difficult to add substantial new land and water to our agricultural resource base, so growth in agriculture is critically dependent on producing more from the same base of land and water. In agriculture, there has been a global shift away from investment in productivity-enhancing R&D, and this has created challenges for reactivating rapid growth in the sector. There are also concerns about some new technologies which have the potential to increase productivity. It will be necessary to resolve these concerns if we wish to improve the output of the land and water we have available. Box 6.4 presents key issues about enabling growth and offers some perspectives to stimulate discussion about how to address them.

6.3.4 Accelerated planning approvals and land and water access

Central to capturing growth in commodity exports is the need to accelerate planning approvals as well as land and water access for mining and farming. Planning approvals are a difficult issue, and will always be subject to differing responses from local communities and other interest groups.

Creating as much certainty as early as possible in the process is critical to encouraging future investment. In many ways certainty is far more important than giving complete freedom to deal with land as miners and farmers see fit. This can be achieved by establishing clear guidelines in each region as to which areas are acceptable for development, and which areas are not. These clear guidelines can also provide certainty and address fears in local communities concerned about changes in land use.

To achieve this certainty, Government planning departments will need to continue increasing their skill sets and resourcing to deal with the increased number of applications. Part of the answer here may lie with the private sector working with communities and planning departments to bring the approval process forward as far as possible. This may be best done by seeking approval for a portfolio or series of projects rather than individual projects independent of each other. Planners will need clearer, simpler pre-set guidelines as to what will be acceptable, and what will not.

6.4 OTHER ENABLERS

In a number of other areas, a coordinated response is required. Taxation policy can do more to encourage investment, whilst ensuring that Australia does benefit from this opportunity. Foreign policy and trade policy can be more aligned with our trade and investment partners. Trade policy can also continue to help open up new markets for our agricultural products. Environmental policies will need to balance achieving environmental objectives with encouraging investment. Water policy will need to be set such that it does not inhibit productivity gains.



7.0 THE UNDERLYING FORCES AT WORK

KEY THEMES:

- Demand growth for most natural resources is strongest as countries move from US\$2,000-10,000 per capita. China is at this critical income level and India is moving towards it.
- Demand for agricultural land and water rises with increasing income levels, as diets shift to more resource-intensive foods and calorie consumption increases.
- Emissions intensity of economic growth is higher in the developing world than in the developed world, but this is unlikely to slow growth in commodity demand.
- Risks to commodity demand growth exist, particularly in the short term, but are most likely to drive volatility, rather than a change in the trend.

At the heart of the opportunity for Australia is a sustained surge in demand for raw materials, driven by the aspirations of the developing world. Conventional economic theory has always predicted various versions of economic convergence – poorer countries catching up to the income levels of wealthier countries. In many parts of the world, this is now happening. As it does, the world is witnessing a surge in demand for the basic materials – minerals, energy, and food – necessary to house and feed a growing global middle class. While this process is not entirely preordained, and there are risks, the momentum is very strong.

7.1 ECONOMIC CONVERGENCE OF THE DEVELOPING WORLD – THEORY TO REALITY?

Since 2000, the nature of global economic growth has been turned upside down (Exhibit 7.1). Until then, global growth was primarily driven by the developed world with about two thirds of growth coming from the developed world, and one third from the developing world. Between 2000 and 2010, this pattern was turned on its head. In the five years to 2010, almost three quarters of global growth came from the developing world. Long-term forecasters typically believe that this trend will be sustained (see Exhibit 7.2).

7.2 “EARTH” AND “FIRE”: SUSTAINED DEMAND GROWTH FOR MINERALS AND ENERGY

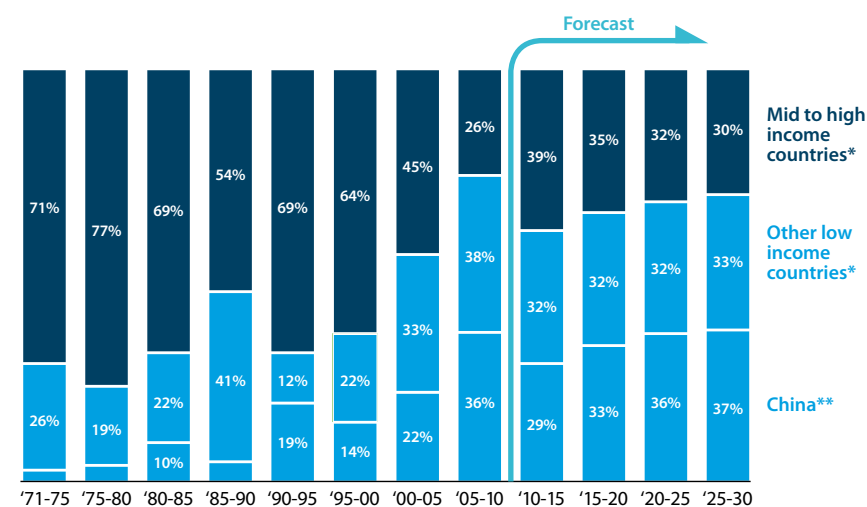
Demand for minerals and energy is primarily driven by two processes: urbanisation and industrialisation. Demand growth for most of the large natural resource sectors is strongest as countries move from around US\$2,000-3,000 per capita up to US\$10,000-15,000.

Urbanisation. Large portions of the population typically move from rural areas to the cities as a result of agricultural productivity gains. This drives rapid growth of essential urban infrastructure such as housing, roads, rail, water, electricity and heating. Exhibit 7.3 shows that urbanisation has been growing in China and India. This is expected to continue. In China this represents around 15-20 million people per year moving to the urban population, whereas in India it is closer to 10 million. Across the world, expectations are that close to 70 million people will be added to the urban population every year from 2010 to 2050 (more than three times the population

Exhibit 7.1

DRIVERS OF GLOBAL GROWTH

(% of world GDP growth by 5-year period, 2005 \$PPP)



* Income levels are as at 2007 in real 2005 PPP terms; high is >\$30,000 per capita (e.g. UK, Canada, Australia); mid is \$10,000-30,000 per capita (e.g. Chile); low is <\$10,000 per capita (e.g. Madagascar, India, Brazil).

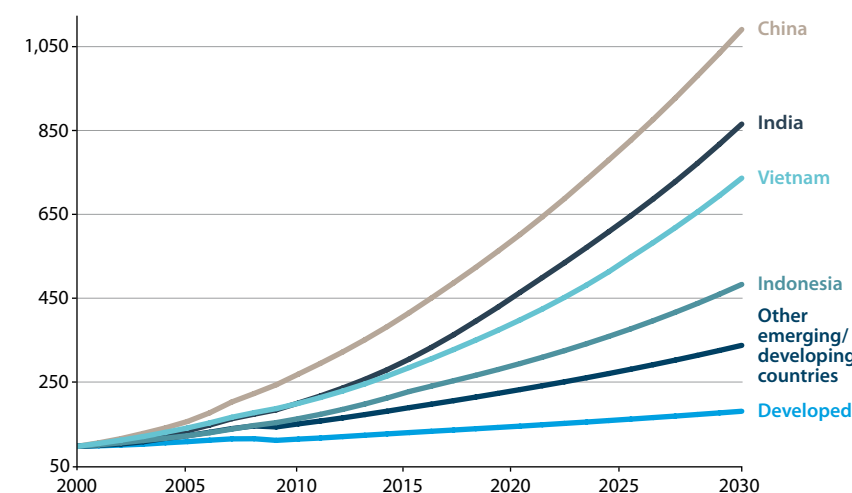
** China comprises 34% of the GDP growth over the period 2010-2030 inclusive.

Source: World Bank; IMF; Global Insight; Penn World Tables; US Department of Agriculture Economic Research Service; PJP analysis.

Exhibit 7.2

REAL PPP GDP

(Index 100 = 2000)



Average growth p.a.	'00-05	'05-10	'10-15	'15-20	'20-25	'25-30
China	9.6%	11.1%	8.9%	7.6%	6.5%	5.7%
India	6.4%	8.0%	8.5%	8.6%	6.8%	6.0%
Vietnam	7.4%	7.0%	7.2%	6.8%	6.5%	6.0%
Indonesia	4.5%	5.7%	6.7%	5.1%	5.0%	5.0%
Other emerging/developing countries	4.5%	4.0%	4.5%	4.1%	3.8%	3.7%
Developed	2.1%	1.0%	2.5%	2.2%	2.1%	2.1%

Source: IMF WEO, 2010; World Bank; Global Insight; Oxford Economic Forecasting; US Department of Agriculture Economic Research Service, 2010; PJP analysis.

of Australia)³⁹, or 2.8 billion people in total. This process is enormously resource intensive, because the infrastructure required uses copious amounts of steel (e.g. buildings, transport infrastructure) and copper (e.g. electricity grids), and involves heavy use of energy.

Industrialisation. Along with urbanisation, economic development is inevitably linked to some level of industrialisation. Historically, economies have progressively moved from primary (agrarian) to secondary (industrial) to tertiary (services). While around one billion people now live in tertiary economies (roughly the OECD countries), the vast majority of the world's population (another five to six billion) are living in less mature economies which are progressively making the transition to industrial economies. This is leading to industrialisation and urbanisation on a scale the world has not seen before. The process of industrialisation is likewise extremely mineral and energy intensive.

China is currently passing through the most critical part of its economic development from a mineral and energy perspective. India is at a somewhat earlier stage of its development and will become increasingly prominent in the next decade. While China lacks many of the domestic resources to supply its growth path, the picture is somewhat different for India (particularly in relation to iron ore), and this will be an important issue for Australian producers. Australia will inevitably have to compete with some level of domestic production in India, but the difficulties of establishing infrastructure and developing resources in India will continue to provide opportunities for Australia.

The results of this process for China can be seen in Exhibit 7.4. Massive growth in Chinese cities has occurred and is expected to continue. Forecasters expect China to have more than 200 cities with a population in excess of one million by 2025. This contrasts with 35 such cities in Europe. Around 50,000 skyscrapers could be built, equivalent to 10 New York-sized cities. Some 170 mass transit systems will be required and five billion square metres of road will need to be paved. The world has not experienced anything like this, and it shows in the commodity demand data. China now accounts for two thirds of the demand for metallurgical coal and more than 50% of the demand for iron ore, with its demand for other key commodities approaching 50%.

As long as the process of urbanisation and industrialisation continues for the five billion people outside of the most developed countries, this strong demand growth seems irrepressible.

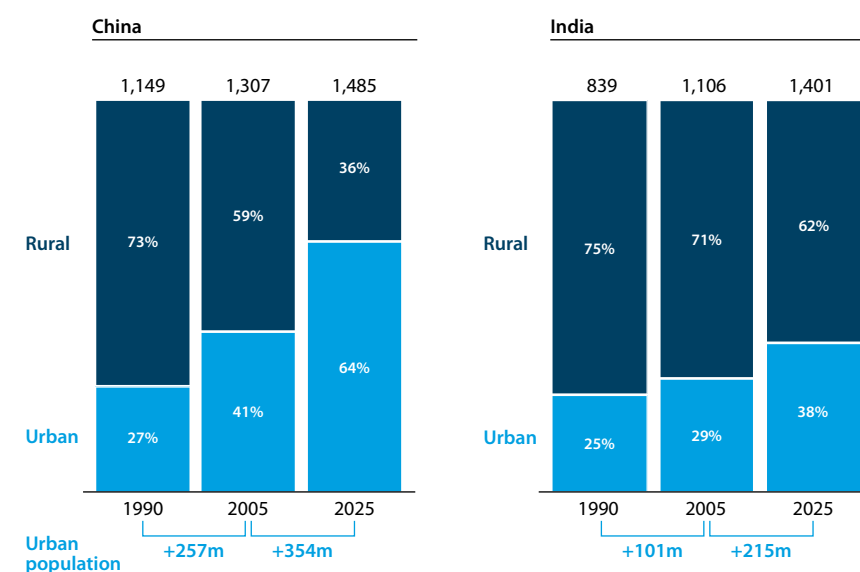
7.3 "WATER": INCREASING WEALTH AND THE DEMAND FOR SOFT COMMODITIES

As income levels increase, total calorie consumption increases (Exhibit 7.5). Whereas average daily kilocalorie consumption in the least developed countries is 2,150 per capita, in developing countries it is around 2,800 and in advanced countries it is around 3,500. Just as important, the nature of those calories changes dramatically. Lower income country diets are focused on cereals, which are typically the least resource intensive foods (that is, they require less land and water per calorie). However, higher income country diets are more focused on fruit and vegetables, sugars, meat, dairy and other animal products such as eggs. Much of this is about a shift in diet from carbohydrates to protein (Exhibit 7.5). These foods are far more water and land intensive per calorie. The net effect of this is that advanced economies use around 2.5 times the water (and land) per person per day relative to the least developed countries, with developing countries somewhere in between.

³⁹ Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Urbanization Prospects: The 2009 Revision.

Exhibit 7.3

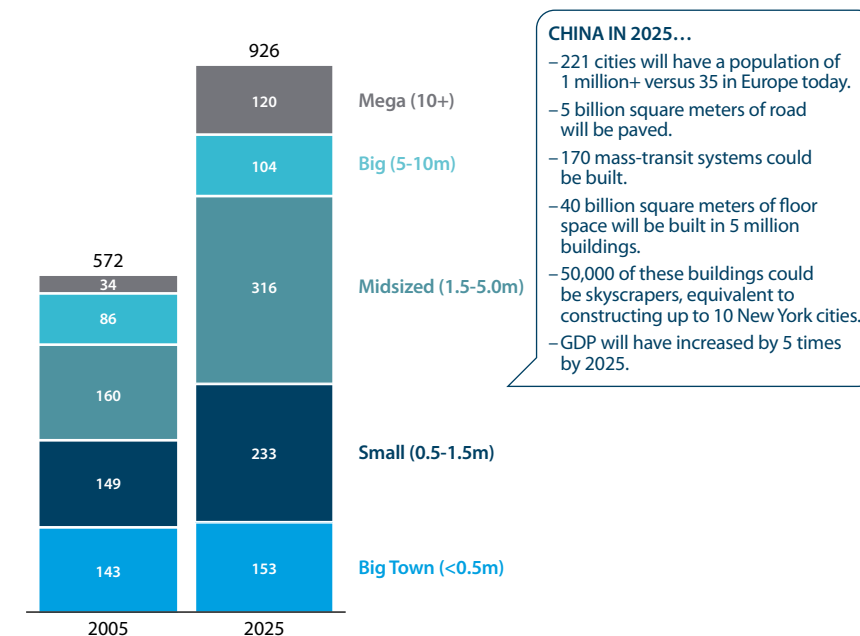
URBANISATION OF CHINA AND INDIA (Population in Millions/ Percent)



Source: BHP Investor Presentation, September 2010.

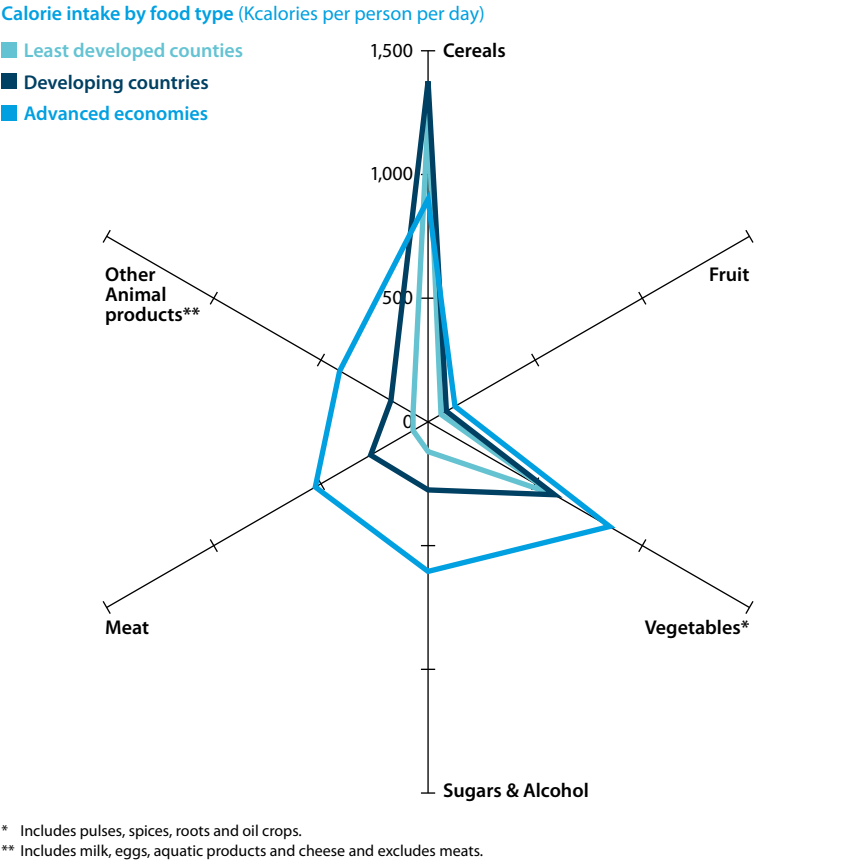
Exhibit 7.4

CHINA'S URBAN POPULATION BY CITY SIZE (Millions of people)



Source: BHP Investor Presentation, September 2010; McKinsey Global Institute, "Preparing for China's Urban Billion", March 2009.

Exhibit 7.5
SOURCES OF CALORIE CONSUMPTION – 2007

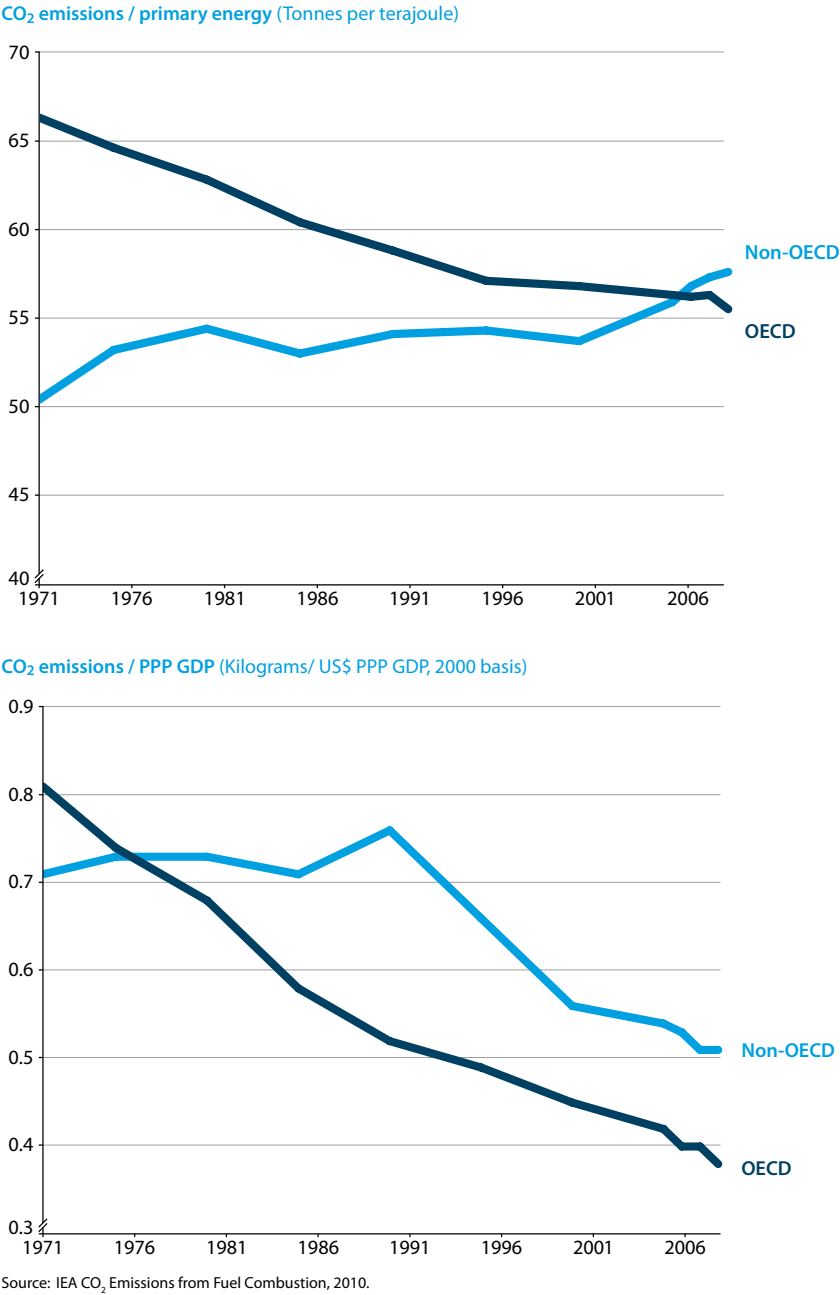


Resource requirements for food production

	Least Developed Countries	Developing Countries	Advanced Economies	World Average
Population (billion)	0.8	4.8	1.0	6.6
Average calorie consumption (Kcal/day/capita)	2,150	2,760	3,450	2,800
Water requirements for agriculture (L/day/capita)	1,600	2,600	3,900	2,700
Water requirements per calorie consumed (L/Kcal)	0.74	0.94	1.13	0.96
Land requirements for agriculture (m ² /capita)	3.1	5.1	7.8	5.3

Source: Food and Agriculture Organisation; IMF; UN.

Exhibit 7.6
CARBON INTENSITY



The shortage of water for food production, combined with increasing demand for more resource intensive foods, shows up in unexpected ways. For instance, in recent years increasing demand for meat in China, with limited potential to access additional agricultural water, has meant that China has had to import large quantities of feed-grain. This has opened up a massive trade in soybeans from Brazil to China. This trade grew from almost nothing to around 20 million tonnes per annum between the late 1990s and today⁴⁰.

In China and India, household consumption of water has an expected growth rate of around 6% per annum from 2000 to 2016, while industrial demand for water is expected to grow around 9% per annum⁴¹.

As income levels rise, demand for water increases through the increasing demand for soft commodities. This increasing demand for soft commodities presents an opportunity for Australia to expand its agricultural sector.

7.4 “AIR”: THE IMPLICATIONS FOR GREENHOUSE GAS EMISSIONS

Urbanisation, economic development and industrialisation also have profound implications for carbon emissions. This was recognised in Australia's Garnaut review of Climate Change⁴², which noted that the emissions intensity (carbon emissions per dollar of GDP) of economic growth is much higher in the developing world than in the developed world (Exhibit 7.6). While there was some reprieve to this trend during the 1990s because of one-off improvements in Chinese energy efficiency, the trend resumed in the 2000s. As we have come to understand that the source of global growth is switching to the developing world, (Exhibit 7.1) a dilemma has arisen. While on the one hand developing world growth has enormous flow on benefits for those populations, it is inevitably carbon emission intensive and has accelerated the pace at which the world is moving to higher atmospheric concentrations⁴³.

Unsurprisingly, this issue was central to the difficulties faced at the Copenhagen Climate Conference in 2009: the developing world, and particularly China, has been reluctant to adopt binding total emission reduction targets which risk curbing their economic development. China and India made voluntary, non-binding commitments to reduce the emissions intensity (emissions per unit of GDP) of their economies by 2020. Other developing countries including Brazil and Indonesia made voluntary commitments to reduce emissions compared to 'business-as-usual' by 2020. By contrast, developed countries made binding commitments to absolute reductions in emissions compared to a base year⁴⁴.

Are these environmental pressures likely to result in a significant reduction in demand for commodities? The economic aspirations of countries like China, India and others on a development path are such that this is unlikely in the timeframe of the analysis in this document. Low cost sources of energy were critical to the economic development of the OECD countries, and the developing world is not in a hurry to substantially increase the cost of its energy⁴⁵. It is true that, over time, this issue will result in some change in the mix of demand for commodities. In time, gas and (perhaps) uranium may substitute for coal, because gas is substantially less carbon intensive. From an Australian perspective, this need not be a great concern,

⁴⁰ China's Soybean and Products Production and Consumption for 2009-10, Chinese Soybeans Import Country-wise for 2008-09, US Department of Agriculture.

⁴¹ "Water footprint of Nations: World Bank, OECD and FAO agricultural Outlook" 2007-16.

⁴² "The Garnaut Climate Change Review", Ross Garnaut, 2008, Cambridge pages 56-57.

⁴³ "The Garnaut Climate Change Review", Ross Garnaut, 2008, Cambridge University Press, page 64.

⁴⁴ Some of these commitments, including Australia's were on a conditional basis.

⁴⁵ Nor, as it happens, is the developed world – recent increases in electricity prices are becoming a critical political issue in Australia, and other parts of the developed world.

because Australia has large gas and uranium resources. Australia has the added advantage of providing energy sources that are lower in greenhouse gas emissions than domestically-sourced fuels in China (particularly for coal).

7.5 RISKS TO DEMAND EXIST, BUT SHOULD NOT BE OVERSTATED

Major structural shifts are notoriously difficult to predict. For example, many market analysts did not foresee the scale of the growth of China or the implications for commodities. However, once a structural shift becomes clear, the real challenge is to understand its likely pathway, and any risks to that pathway. While there are risks to the momentum of developing world growth and commodity demand, the dynamics of this growth are increasingly well understood⁴⁶.

Despite recognising the strength of a structural shift it is still important to consider potential risks to the process. 'Black swans'⁴⁷ always lurk on the horizon, even if they are hard to see (see box 7.1). However, most of these risks are likely to be short-term in nature, and will drive volatility rather than undermining the trends outlined in this chapter.

⁴⁶ Port Jackson Partners was early at recognising and forecasting the nature of that growth and the commodity demand arising from it. In past published work, Port Jackson Partners has consistently taken the view that the economic growth of the developing world will have a profound effect on commodity markets. For example, "Economic Evaluation of the Impact of Lost Iron Ore Production and Share" Report by Port Jackson Partners to the National Competition Council, 2008.

⁴⁷ A 'black swan' event is described by Nassim Nicholas Taleb in his 2007 book 'The Black Swan' as having the following three attributes: it is an outlier, it carries an extreme impact, in spite of its outlier status, human nature makes us concoct explanations for its occurrence after the fact, making it explainable and predictable.

BOX 7.1 POTENTIAL RISKS TO THE STRUCTURAL TRENDS OUTLINED

Risk	Response
<p>Leadership risks in China:</p> <p>China remains critical to the commodity demand story in the short term.</p>	<p>While China is continuing to manage this issue carefully, the risk is also mitigated in two ways. First, India and other developing countries will become increasingly important for commodity demand over time. Second, China has a long-term commitment to economic development and the continual shift of the population out of poverty.</p>
<p>Political and economic breakdown:</p> <p>A broader breakdown in the economic and political systems that are supporting the growth of the developing world is always a possibility. While growth of world trade and global investment flows almost became an assumption in the lead up to the GFC, the increased fragility of the global system is now more apparent.</p>	<p>The interconnection between the developing world and the developed world, particularly China and the United States, is deeper than at any time in history. Most major countries have an interest in maintaining the economic and political institutions that support their prosperity.</p>
<p>Environmental costs constrain growth:</p> <p>The current and potential environmental costs of economic growth are well known, and have been raised as a potential constraint on growth since the 1970s and before⁴⁸.</p>	<p>The prevailing attitude in developing world countries is that this is primarily the responsibility of the developed world, and it should not curb growth in the developing world. One question is whether Australia wants to expand capacity in emissions intensive sectors to meet that demand.</p>
<p>Demand constrained by rising prices:</p> <p>As commodity prices rise, demand could be constrained by some combination of conservation, substitution, innovation or even economic stagnation.</p>	<p>Fast growth in demand is consistent with lower prices for the highest priced commodities. Indeed, this report assumes a significant reduction in prices for many commodities. If Australia is successful in taking its share (or more) of the growth in demand, many of the adverse effects of lower prices on revenue will be mitigated.</p>
<p>A rapid restructuring of the Chinese economy:</p> <p>It is clear that there are some significant imbalances in the Chinese economy. The exchange rate is suppressed versus the US dollar. Investment and savings rates are high and consumption is low as a proportion of economic activity. These imbalances are likely to be addressed over time, and, consistent with our assumptions, the resource intensity of growth will fall. Because of the focus of the Chinese leadership on managing this restructuring process, a sudden short-term reduction is always possible, and may lead to the fall in many commodity prices anticipated in this work and consensus views in the market place.</p>	<p>Commodity demand is likely to continue growing strongly, despite a slowdown in China. None of this detracts from expected growth in other countries.</p>

48 See *The Limits to growth: A report for the Club of Rome's Project on the Predicament of Mankind*, Donella H. Meadows, Jorgen Randers, Dennis L. Meadows, and William W. Behrens (1974).



8.0 CONCLUSION

KEY THEMES:

- *The current opportunity for Australia is under-estimated.*
- *Natural resources and associated support can sustain other 'new economy' growth sectors.*
- *Unprecedented capacity expansion would require a whole-of-economy approach involving governments, business, capital markets and communities.*
- *Australia is beginning the policy debates necessary to maximise its ability to capture the opportunity and minimise any negative effects.*
- *Focusing on the size of the prize is the framework needed to build common ground.*

Many of the past economic reform agendas in Australia, particularly in the 1980s and 1990s, were driven by recognition that failure to address the nation's lack of openness and competitiveness would result in Australia being left behind.

What makes today's situation different is that, with the exception of sectors and regions suffering from a stronger currency, there is not the same negative driver for change. Only aspiration can motivate Australia to fully engage in this discussion and to address the issues outlined in this report. The good news is that the prize is so big, and the potential benefits so widespread, that Australia has every reason to embrace the opportunities. Capturing as much of the opportunity as possible would provide unprecedented benefits to the Australian economy.

This report puts forward two cautionary notes. First, capturing Australia's share of this opportunity cannot be taken for granted as a result of the ferocious competition emerging from other resource-rich nations around the world. Second, there is potential for some sectors of the Australian economy to be hurt along the way. However, it is clear that measures that boost the capacity of the whole economy would maximise the opportunity for Australia, broaden the benefits across the economy and mitigate many of the negative impacts.

Market prices are signalling one of the great needs of our time – to provide the relatively poor of the world with the raw materials to move beyond subsistence and poverty. Unlike past episodes of growth, this will be long-lasting, dependent on technology and high-end skill sets and has the potential to deliver decades of economic prosperity.

It may be timely to return to some of the successful reform processes of the past. Gary Banks, Chairman of Australia's Productivity Commission, has pointed out that: "the major reforms that defined the [1980s and 1990s] followed considerable research and public testing of the pros and cons of different possible reform measures. This generally occurred through review processes that made effective use of discussion papers, draft reports or 'green papers'. In most cases, sufficient time was allotted to the consultation processes to enable proposals to be properly explained, digested and responded to, and to inform a wider public debate. This was central to the industry assistance and national competition policy reform processes, as well as to the major reforms to financial regulation and taxation."⁴⁹

⁴⁹ Gary Banks, 'Successful reform: past lessons, future challenges', Keynote address to the Annual Forecasting Conference of the Australian Business Economists, 8 December 2010.

In addition to the unprecedented benefits to the Australian economy, Australia has an important role to play in supplying the developing world with the resources needed to lift its population out of poverty. The opportunity for Australia in doing this is enormous and the potential benefits widespread. This does however require an invigorated discussion in Australia to position itself thoughtfully and energetically to capture as much of the opportunity as possible.

If Australia gets this right, it can be the lucky country, the clever country and a good global citizen all at the same time.

ABOUT PORT JACKSON PARTNERS

Port Jackson Partners is a consulting firm providing advice to CEOs, boards and senior managers to help set corporate direction, define business strategies and develop their organisations. The firm was founded in 1991 by two former Directors of McKinsey & Company and has grown over the past two decades into one of Australia's most respected strategy consulting firms.

ANGUS TAYLOR

Angus Taylor has been a Director of Port Jackson Partners since 2002. Angus has extensive experience working with senior executives, boards and their organisations to shape and implement their strategic agenda. He works across a range of sectors, including resources, industrials, service companies, agriculture and the public sector. Much of his work in recent years has focused on helping to facilitate growth strategies through a combination of transactions, organic growth and organisational redesign. As a result he has worked on a number of the highest profile Australian corporate transactions and projects in recent years.

In the course of his work, he has helped his clients deal with many of the most pressing issues they face, including how to respond to the rapid growth of the developing world, how to think about emerging regulation, and how to respond to fast evolving markets for capital, products and talent.

Outside of his consulting work, Angus has active interests in a number of companies in agriculture and professional services, and he sits on the Council of St Andrew's College at the University of Sydney. He regularly teaches executive education courses in strategy and strategy implementation for a range of Universities, including UNSW and Duke University.

Angus has a MPhil in Economics (Rhodes Scholar), Oxford University and has degrees in Economics and Law, Sydney University (University Medal in Economics). Prior to joining Port Jackson Partners he was a Partner at McKinsey and Company.

ROBERT HANSON

The four illustrations in this report are the work of illustrator Robert Hanson.

