Collaboration essential – infrastructure planning and delivery in Australia’s resource regions

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GIRAF Workshop
September 2013
Outline

- Minerals and energy market and development overview
- MCA Vision 2020 infrastructure project
- What does this mean for infrastructure?
- Infrastructure planning and coordination in Australia
- Pilbara case study
- Leading practice in infrastructure planning and development
Australia’s minerals and energy markets are strong...

55 per cent of worldwide LNG capacity is under construction is located in Australia. By 2015-16, Australia’s LNG exports are forecast to increase to 41 million tonnes, an increase of 126 per cent from 2010-11.

In 2015-16, iron ore export earnings are projected to reach $68 billion.
The Pilbara, and Bowen and Galilee Basin Regions are well located to supply Asia with mineral and energy products.
Australia’s engineering and construction challenge – the largest investment wave since the 1800s gold rushes*

**WA & NT projects to 2016: USD220 billion+**
- Offshore petroleum basins

**Pilbara Region**
- LNG, iron ore, infrastructure

**Mid West Region**
- Iron ore, gold, uranium, nickel,

**South West Region**
- Alumina, gold

**Gladstone and North West Economic Triangle**
- Base metals, bauxite-alumina

**Queensland projects to 2016: USD100 billion+**
- Bowen, Surat and Galilee Basins
  - Coal, CSG, LNG, infrastructure

**South Australia projects to 2016 USD10 billion+**

*Reserve Bank, Australia
Western Australia case: investment will result in decades of increased production with lower volatility

Historic and forecast production value* for WA’s key resources

Source: ACIL Tasman analysis

* At ten year average prices
Mining and *related sectors* are bigger than most people think: changing the mindset

*METS* output is growing at 15 to 20% a year

- 4% of national output in 2002-03
- 8.4% in 2011-12

*METS* contribution to *GDP*

- 6.7% in 2010-11
- Est. 9.4% in 2012-13

Many METS are knowledge- and technology-intensive

Source: Australian Treasury and Ed Shan / Minerals Council of Australia
Mining and *related sectors* in Australia are bigger than most people think: implications for infrastructure

Gross Value Added – resource economy 2011-12
Share of nominal GVA, financial year

Resource economy accounts for 18% of GVA: 11.5% directly from extraction and processing; 6.5% from other sectors providing inputs

Resource employment by industry 2011-12
Share of total employment, financial year

Resource economy accounts for 10% of employment: 3.25% directly from extraction and processing; 6.75% from other sectors providing inputs

Source: Rayner and Bishop, Reserve Bank of Australia February 2013
It’s not only about mining: other growth drivers

1. Corporate shift to Australia
2. Service and technology sector growth
3. Trade & foreign investment
4. Agriculture and food sector growth
Western Australia case: Employment growth: driven by mining, but more than just mining jobs

Employment growth by industry sector 2010-2020

Australian mining employment multiplier is 3 – 4
Africa 7 – 10

Source: CCIWA: Building Western Australia’s Workforce for Tomorrow, June 2010
Taking a broad view: indirect and induced benefits

Economic output

Direct
- Purchasing expenditure for local goods and services
- Payments to employees

Local manufacturer or service provider

Indirect
- Subsequent backward expenditure for local goods and services along the supply chain
- Income of supply chain employees
- Taxes paid by suppliers to the Government

Induced
- Household consumption as direct and indirect employees spend their income within the local economy

Local dealer

- Income of dealer's employees
- Taxes paid by dealer to the Government

Household consumption as direct and indirect employees spend their income within the local economy

In Australia, for every $1 of mining revenue, 40¢ is spent on goods and services: Reserve Bank

Adapted from Saipem 2011
Minerals Council of Australia 2020 Vision Infrastructure Project

- 21 growth regions
- Current projects and production
- Adequacy of current infrastructure
- Growth scenarios for each region
- Interaction of regions
- Infrastructure gaps and needs
2020 Vision Infrastructure Project: growth regions
Minerals & petroleum growth prospects remain strong

Many infrastructure gaps now

Worse in future – could inhibit development

Community infrastructure very important

Detailed region by region planning and provision needed to
  - overcome current infrastructure deficits
  - manage for growth
Australia – State and Territory Governments

Federal Government

Different approaches

Need coordination & $$
Australian and state approaches to infrastructure planning

- Strategic Infrastructure Plan for South Australia

- NSW State Infrastructure Strategy

- Pilbara Planning and Infrastructure Framework

- Infrastructure Australia http://www.infrastructureaustralia.gov.au/ (see Publications)
Infrastructure Australia's Aim

• To drive the development of a long term, coordinated national approach to infrastructure planning and investment, focusing on transport, water, energy and communications

• Seven strategic priorities
  ● Expanding Australia's productive capacity
  ● Increasing Australia's productivity
  ● Diversifying Australia's economic capabilities
  ● Building on Australia's global competitive advantages
  ● Developing Australia's cities and regions
  ● Reducing greenhouse emissions
  ● Improving social equity and quality of life in our cities and regions
Infrastructure Australia approach

Priorities

- Identifying, prioritising and investing in infrastructure that delivers real economic, social and environmental benefits
- Creating new opportunities to fund and finance infrastructure
Infrastructure Australia Goals

- Seven priority themes across economic infrastructure sector
- Mechanisms by which infrastructure can be more efficiently funded and financed
Infrastructure Australia's Approach

• A national perspective to complement state and territory ambitions
• A triple-bottom line approach
  ● strong emphasis on benefit to cost ratio analysis (including wider economic benefits).
• Efficient use of existing infrastructure and resources
• Maximise the productivity of people and assets
• Examine demand and supply side patterns, options and solutions
• A long term, whole-of-life approach
• Optimise the role of both the public and private sector
Tax Loss Incentive for Designated Infrastructure Projects

- Implemented July 2013
- To encourage private investment in nationally significant infrastructure
- Goal to support up to $25 billion in new private sector infrastructure investment
The Pilbara Region dominates Western Australia’s Gross State Product

Value of minerals and energy production from Pilbara (2011)

<table>
<thead>
<tr>
<th>Minerals</th>
<th>Value $Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Ore</td>
<td>60,299</td>
</tr>
<tr>
<td>Gold and Silver</td>
<td>1,006</td>
</tr>
<tr>
<td>Copper</td>
<td>643</td>
</tr>
<tr>
<td>Manganese and Salt</td>
<td>585</td>
</tr>
<tr>
<td>Construction Materials</td>
<td>72</td>
</tr>
<tr>
<td>Tantalite, Tin and Gems</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62,665</strong></td>
</tr>
</tbody>
</table>

Offshore Petroleum

<table>
<thead>
<tr>
<th>Petroleum</th>
<th>Value $Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil and Condensate</td>
<td>12,004</td>
</tr>
<tr>
<td>Liquefied Natural Gas</td>
<td>9,344</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1,401</td>
</tr>
<tr>
<td>LPG Butane and Propane</td>
<td>746</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23,495</strong></td>
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</tbody>
</table>

Other industry sectors

<table>
<thead>
<tr>
<th>Sector</th>
<th>Value $Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>350</td>
</tr>
<tr>
<td>Agriculture</td>
<td>50</td>
</tr>
<tr>
<td>Retail</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>800</strong></td>
</tr>
</tbody>
</table>

The Pilbara generates ~ 80% of WA’s minerals and energy production value of $107 billion (2011)

The Pilbara has a Gross Regional Product larger than some Australian states, but most flows elsewhere – including to Perth and as returns to capital.
Phases in development of Pilbara Region

1960s
- Iron ore deposits delineated; First mines, railways, ports and towns established under State Agreements and funded by major mining companies;
- Population <10,000

1970s
- Further mines and mine towns established;
- Project-specific State Agreements written for iron ore, solar salt;
- Offshore petroleum deposits delineated;
- Govt. plans for diversified industry in Pilbara

1980s
- Growth of iron ore production based on Japanese demand;
- North West Shelf Venture Domgas & LNG projects commissioned;
- Manganese and gold mining started

1990s
- New mines established by all three major companies;
- Growth of iron ore production and expansion of NWSV LNG project based on Japanese demand;
- BHP builds HBI plant; Govt. plans estate for petrochemical industry;
- Native Title Act passed

2000
- Rio Tinto acquires Robe; BHPB merges with Billiton - these majors increase iron ore production;
- Expansion of NWSV LNG project; Pluto LNG project;
- Gorgon JV State Agreement for Barrow Island;
- Govt. plans estate for petrochemical industry;
- Growth of iron ore production based on Chinese demand;
- Entry of new iron ore producers;
- Gorgon LNG construction begins;
- Fly in / Fly Out workforces;
- Population 45,000

2010
- Wheatstone LNG project construction;
- Onslow to be a new LNG industry hub;
- Looking into the future:
  - Iron ore 600 Mtpa (+150% on 2010);
  - LNG 50 Mtpa (+200% on 2010);
  - Population 60,000?

2020
- Founded on iron ore
- Energy emerges
- Chinese demand
Pilbara infrastructure investment

- Early development 1960s – 1980
  - Three iron ore producers, two salt operations
    - steady growth, short term planning, based on Japanese demand
    - all developments under State Agreements on project-by-project basis
  - Companies provided most infrastructure – rail, ports, water, power, housing, community infrastructure
    - infrastructure responsibilities defined by State Agreements
    - production infrastructure (rail, ports, power, water) planned, funded and built by companies, subject to government approval under Agreements
    - rail and ports seen as part of production chains - used only by owner
    - government provided roads, power distribution and water distribution, and education and health services
  - Focus of governments was on commitments by companies under *State Agreements* to future ‘value added’ processing
Pilbara infrastructure investment

New opportunities for development 1980s – 2000

- Offshore natural gas emerges as game-changer in WA economy
  - State funds Dampier – Perth natural gas 1500 Km pipeline
  - State energy agency signs take-or-pay for domestic gas to underwrite NWS
  - All developments under project-by-project State Agreements
- LNG exports by NWS JV commence and grow threefold
- New, major gas fields discovered offshore from WA
- Government plans estate for petrochemicals and other gas processing
- BHP builds and closes iron ore processing (HBI) plant in $3 billion failure
- Fly-in / fly-out (FIFO) workforces used extensively to minimise community infrastructure costs
- Commonwealth passes Native Title Act
Pilbara infrastructure investment

**Development since 2000**

- Multiple iron ore companies (including Chinese FDI), four LNG developments/operations, several other mining operations
  - rapid growth, multiple options, long term planning
- Companies still provide production infrastructure – rail, ports, water, power, employee housing
  - production infrastructure (rail, ports, power, water) used *mostly* by owner – rail and ports part of production chains
- Sharing of now-State-owned ports, litigation over sharing of rail
- ‘Normalisation’ of towns – several now support multiple company operations
- Governments provide community infrastructure and develop towns
  - shortage of housing and community facilities and services (eg, education and health); high housing construction and rental costs
Future Pilbara production represents a quantum shift in output – with big implications for infrastructure.

Iron ore

Oil and gas (LNG)

Source: Draft Pilbara Planning and Infrastructure Framework 2011
Pilbara infrastructure planning changes

- **Overall**
  - framework for planning and *all* infrastructure
  - cooperative planning within agreed growth parameters
  - hypothecation of royalty revenues to fund infrastructure

- **Ports**
  - move to multi-user ports to allow for investment diversity

- **Rail**
  - future multi-user railways with independent operator
Infrastructure planning changes (2)

- Roads
  - long-term planning, increased government investment,

- Land, housing and community infrastructure
  - long-term planning; coordination between companies and government

- Energy
  - government seeking to establish Pilbara electricity grid

- Water
  - cooperation between companies and government
Karratha growth plan – ensuring infrastructure for service industry
What we have learned from Pilbara experience

- Predicting the future is very difficult
  - a guiding overall vision is needed, with agility to respond to global forces
  - uncertainty (in part) can be managed through options approach
- *Early* planning and coordination of infrastructure is essential
  - partnerships between government – mining industry – infrastructure providers needed, but government needs to be careful about getting financially involved in mining business
- Efficient integrated production chains are vital for global competitiveness of resource development operations
- *Resource corridors* provide holistic approach and options for future development
Leading practice in infrastructure planning and development (1)

- Set **strategic goals** that communicate the direction of national or regional development within a sustainability or triple bottom line framework.

- Agree on **scenarios** for economic growth and structural change, demographic growth and change, regional development and potential major projects.

- Apply rigorous **whole-of-government and whole-of-jurisdiction approaches** to infrastructure planning, including:
  - Coverage of all classes of infrastructure
  - Common approach to assessing all infrastructure
  - Cross-agency, top down and bottom up planning
  - Consistent approach between levels of government
  - Involvement of the private sector

From *Best Practice in Infrastructure Planning and Delivery*, Working Paper for Northern Territory Infrastructure Strategy, ACIL Tasman September 2008
Leading practice in infrastructure planning and development (2)

- Use **demand management** approaches to avoid or delay expensive supply investment

- **Land** is a fundamental class of infrastructure. Land use planning is also required

- A strategic approach to long-term infrastructure **management**, maintenance and upgrading
Leading practice in infrastructure planning and development (3)

- Mechanisms to allow decision-making in the face of uncertainty, eg “real options" economic tools

- Leading practice jurisdictions have a consistent, integrated approach to infrastructure planning, delivery and management and provide a suite of planning tools under “total asset management”

- Innovation in engaging private sector in delivery and finance