International Mining for Development Centre

Mining and sustainability: experience from Australia

Mendoza, 17 April 2014

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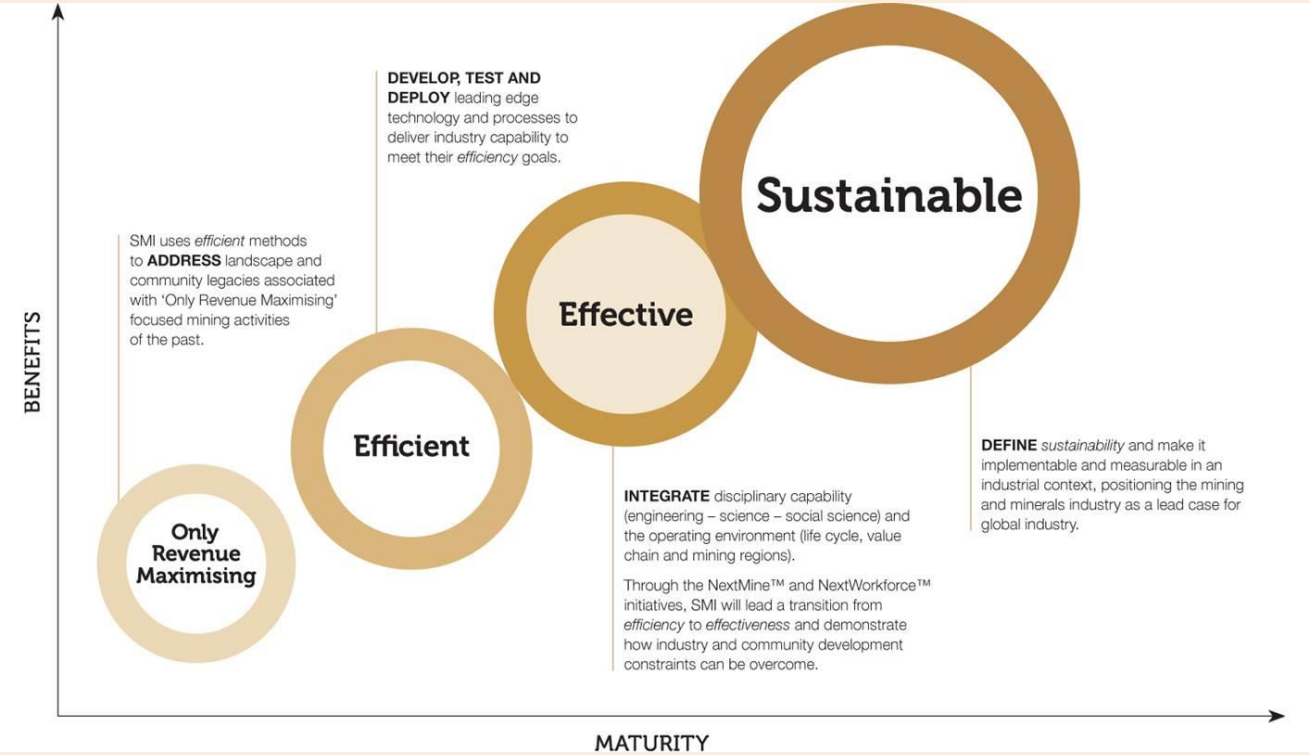
Summary

- Mining generates strong and sustainable benefits for Australia
  - Exports, revenue, business, employment, technology transfer
- Australia faces difficult issues relating to mining, agriculture, community and governance
  - Eg, land, water, social licence, cross-sectoral impact, competitiveness
- We have made mistakes, learned, and defined pathways to resolve issues and maximise benefits
- Mining, agriculture and other sectors co-exist, mostly harmoniously and synergistically
- We must continually improve to meet changing stakeholder expectations and respond to new knowledge
- Australia is very happy to share what we have learned and continue to learn

Outline

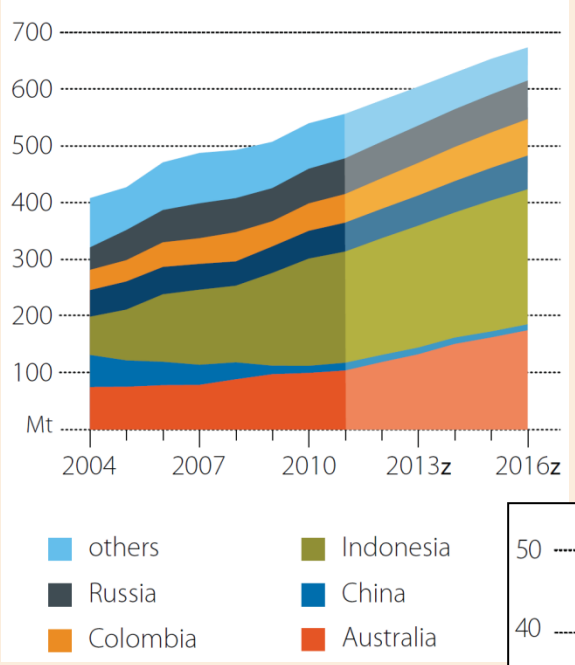
- Mining and sustainability overview
- Australian mining and mining services sector
- Governance of mining, agriculture and water in Australia
- Managing issues of sustainability
- Water management issues and approaches
- Mining and local economic development
- Some tools and frameworks
- Building education, training and research capacity

Mining and sustainability: an approach
Sustainable Minerals Institute, The University of Queensland



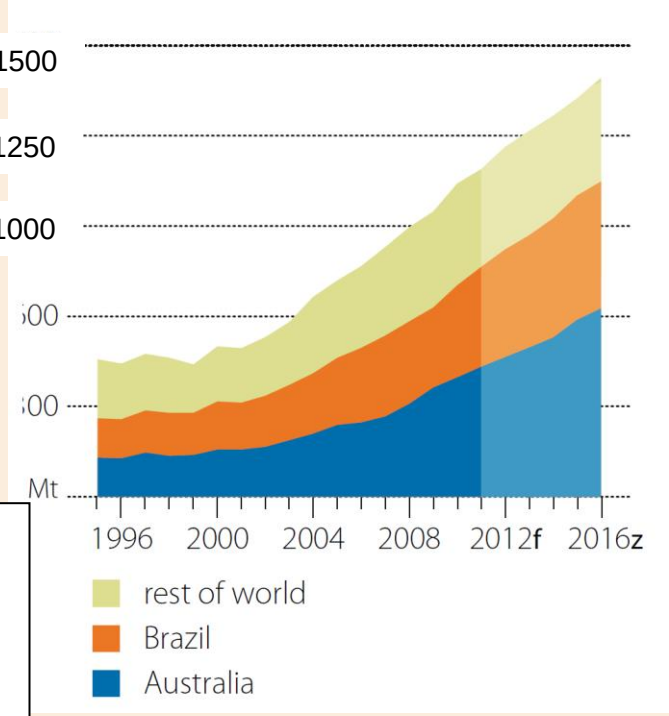
Stage 1: Only revenue maximising
Stage 2: Efficient - Enhancing performance through individual activities
Stage 3: Effective - Improve benefits and performance through the connectivity with environments, communities and industry
Stage 4: Sustainable - Embedding sustainability in all decision making and business practices to consider the economic and environmental needs of current generations without compromising the needs of future generations

Australia's minerals and energy markets remain strong…



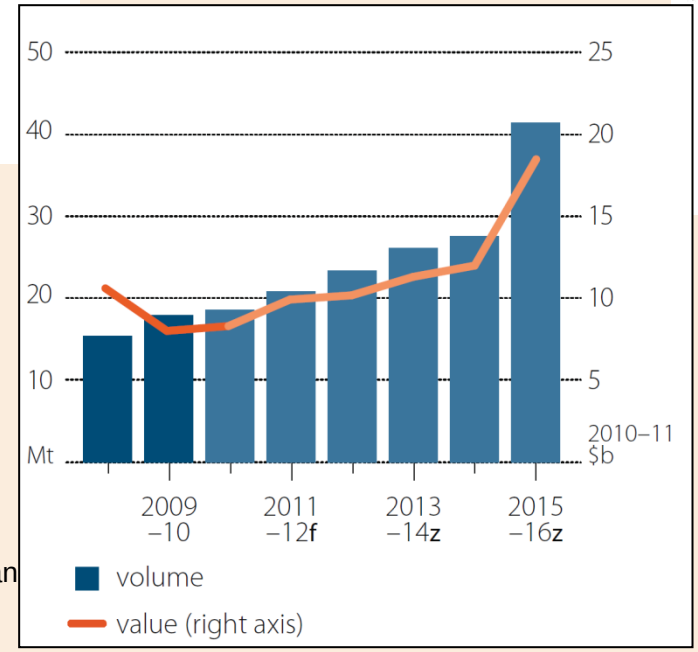
Major thermal coal exporters

Major iron ore exporters



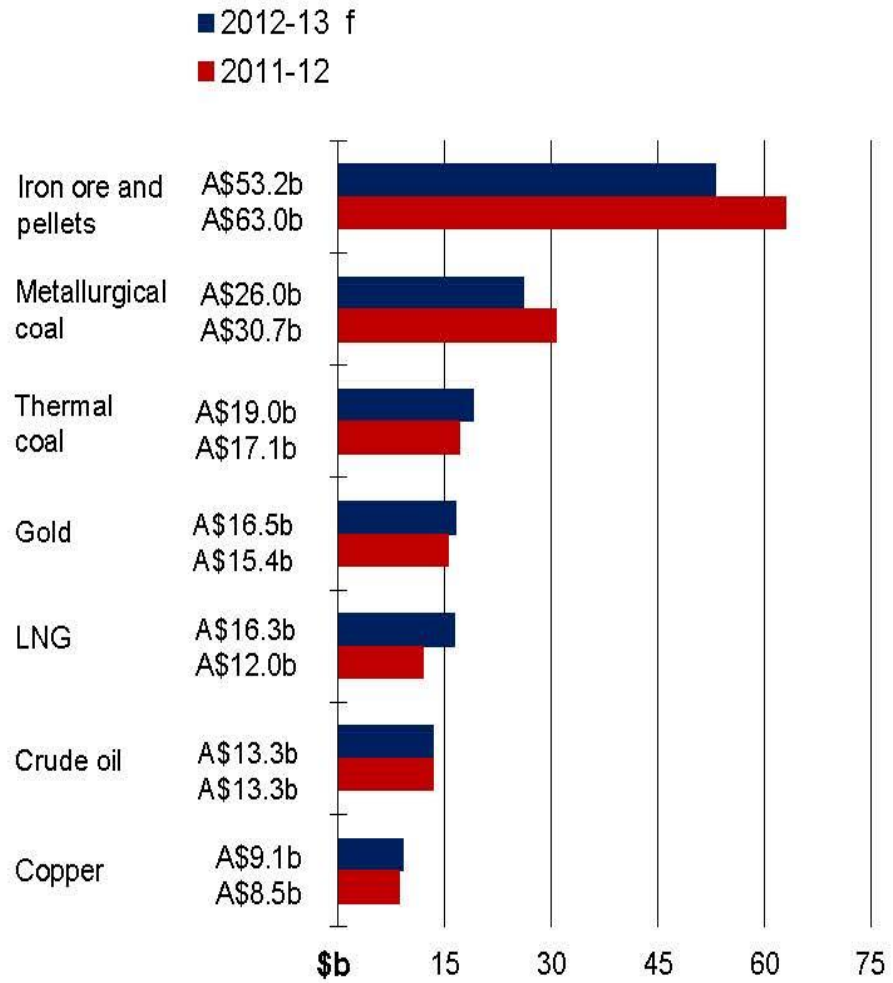
In 2015-16, iron ore export earnings are projected to reach $68 billion

Australian LNG production



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

Volumes, prices & values of key exports

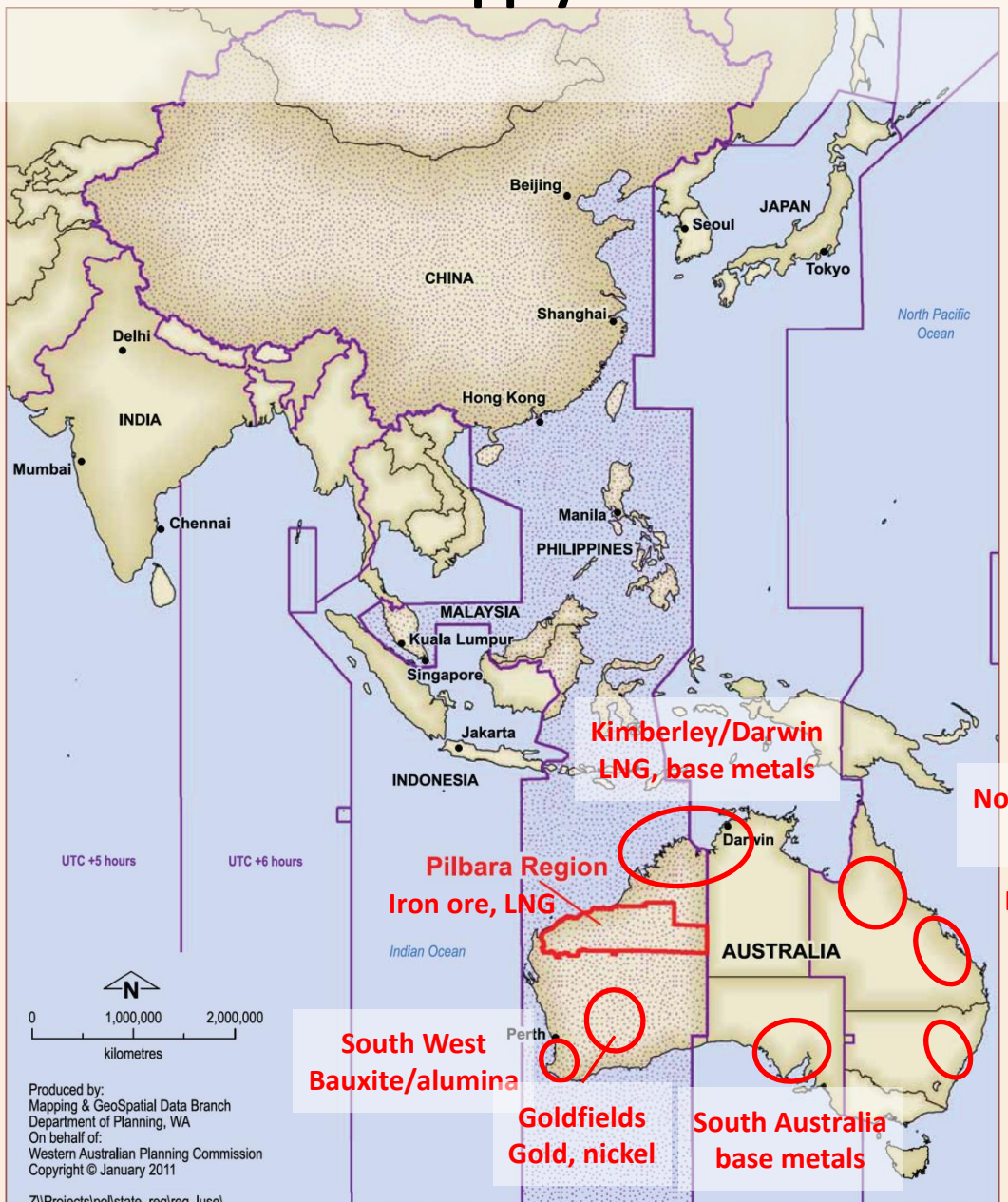


2012–13

	volume	world price	value
Iron ore and pellets	▲ 8%	▼ 27%	▼ -16%
Metallurgical coal	▲ 12%	▼ -28%	▼ -15%
Thermal coal	▲ 14%	▼ -11%	▲ 11%
Gold	▲ 5%	▼ -4%	▲ 7%
LNG	▲ 21%	▲ 12%	▲ 36%
Crude oil	▲ 3%	▲ 2%	● 0%
Copper	▲ 10%	▼ -4%	▲ 7%

Source: Bureau of Resources and Energy Economics

Australia is well located to supply Asia with mineral and energy products



The 'new normal' minerals market is still okay, but competitiveness is vital to maintaining growth…

It's not only about mining: other growth drivers

1 **Corporate shift to Australia**

2 **Service and technology sector growth**

3 **Trade and foreign investment**

4 **Agriculture and food sector growth**

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

LNG, mining

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

Queensland projects to 2016: USD100 billion+

Bowen, Surat and Galilee Basins
Coal, CSG, LNG

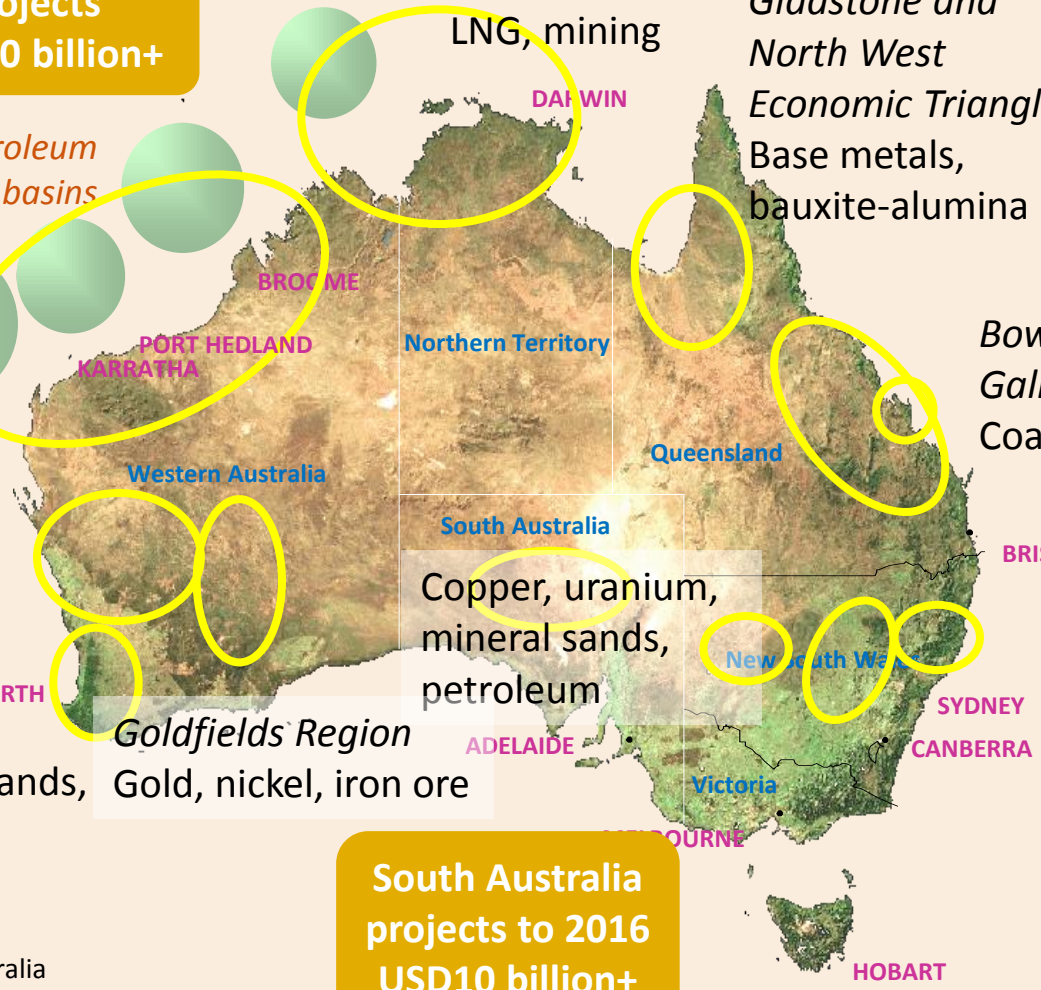
Mid West Region
Iron ore, gold, uranium, nickel,

South West Region
Alumina, mineral sands, gold

Goldfields Region
Gold, nickel, iron ore

Copper, uranium, mineral sands, petroleum

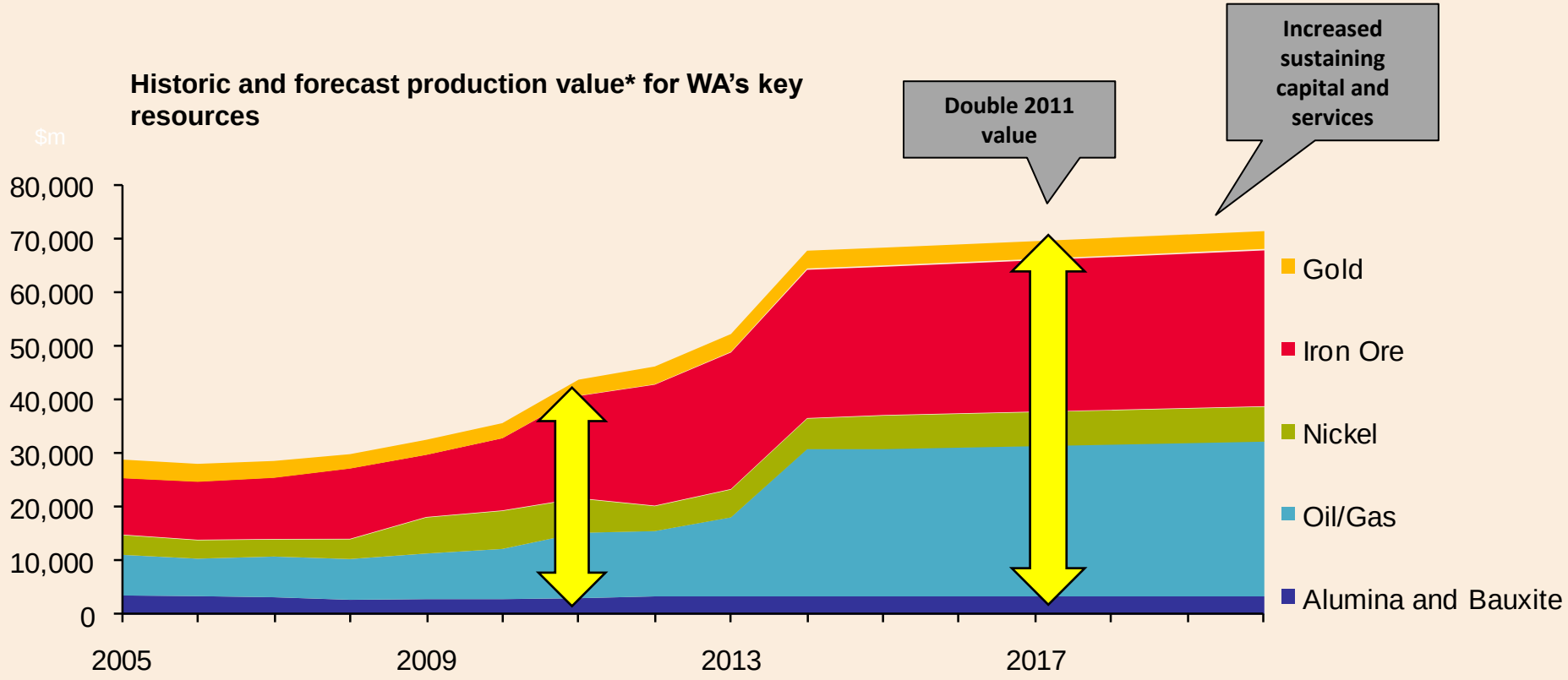
New South Wales
Coal, gold, base metals



South Australia projects to 2016 USD10 billion+

*Reserve Bank, Australia

Western Australia case: investment will result in decades of increased production with lower volatility



Source: ACIL Tasman analysis

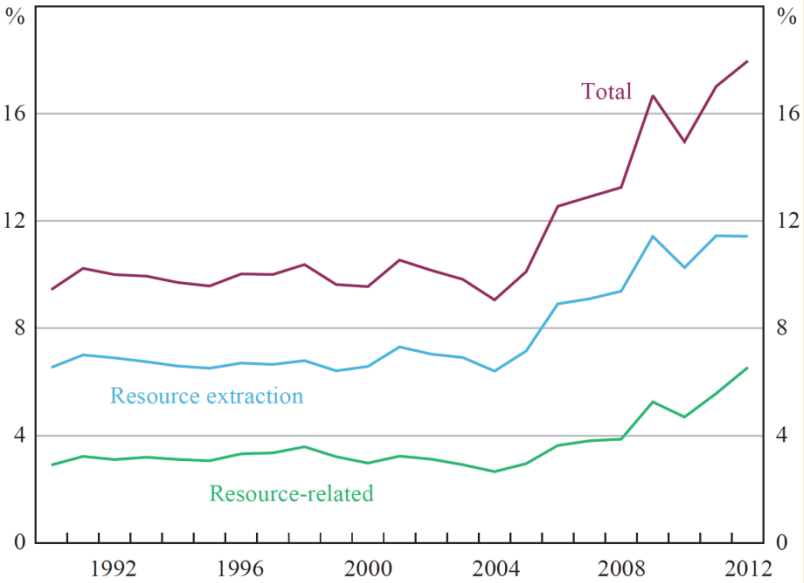
* At ten year average prices

Economía de recursos en Australia: mayor a lo que se había medido tradicionalmente

Valor Añadido Bruto – economía de recursos 2011-12

Cuota de VAB nominal, año fiscal.

(ha crecido más del doble en los últimos 10 años)

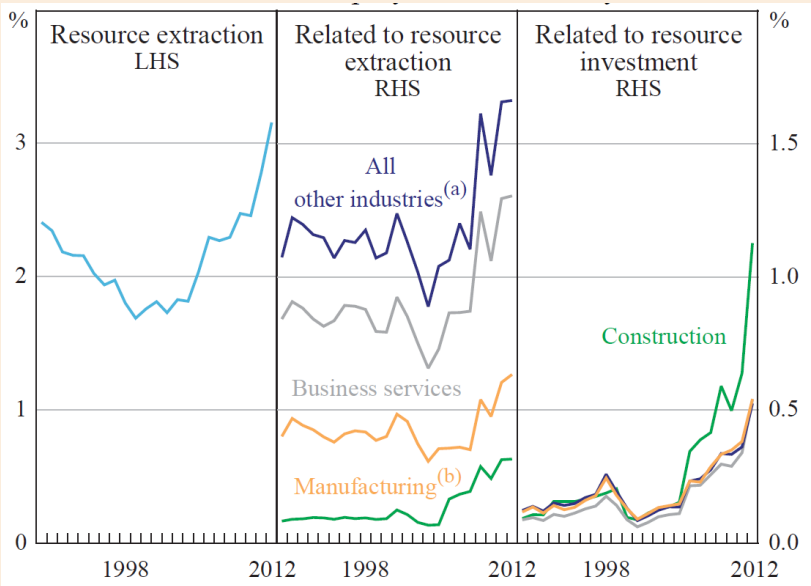


18% de VAB

11.5% directamente de la extracción y el procesamiento
6.5% de otros sectores que proporcionan insumos

Empleos generados por la economía de recursos 2011-12

Cuota de empleo total, año fiscal.

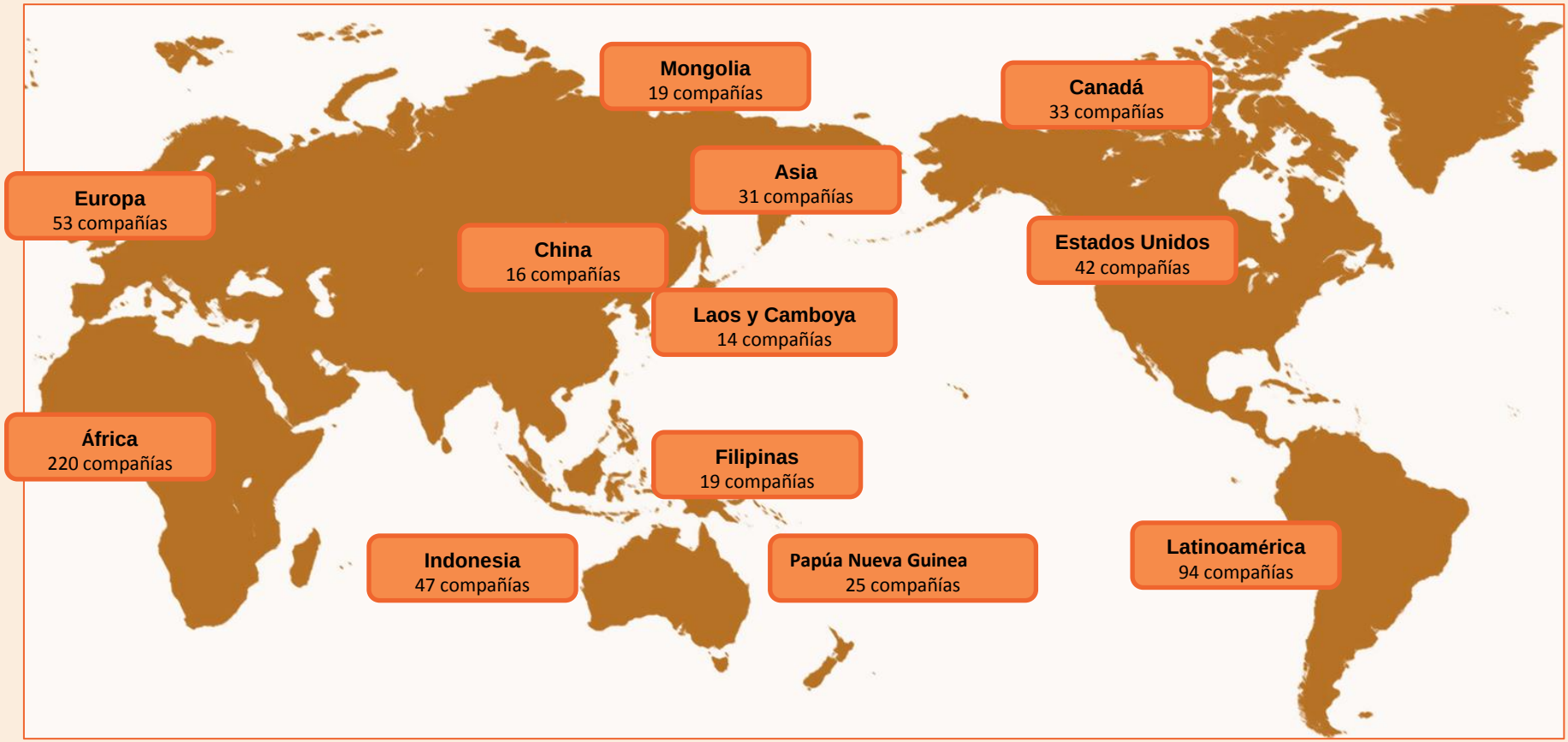


10% de empleo

3.25% directamente de la extracción y el procesamiento
6.75% de otros sectores que proporcionan insumos

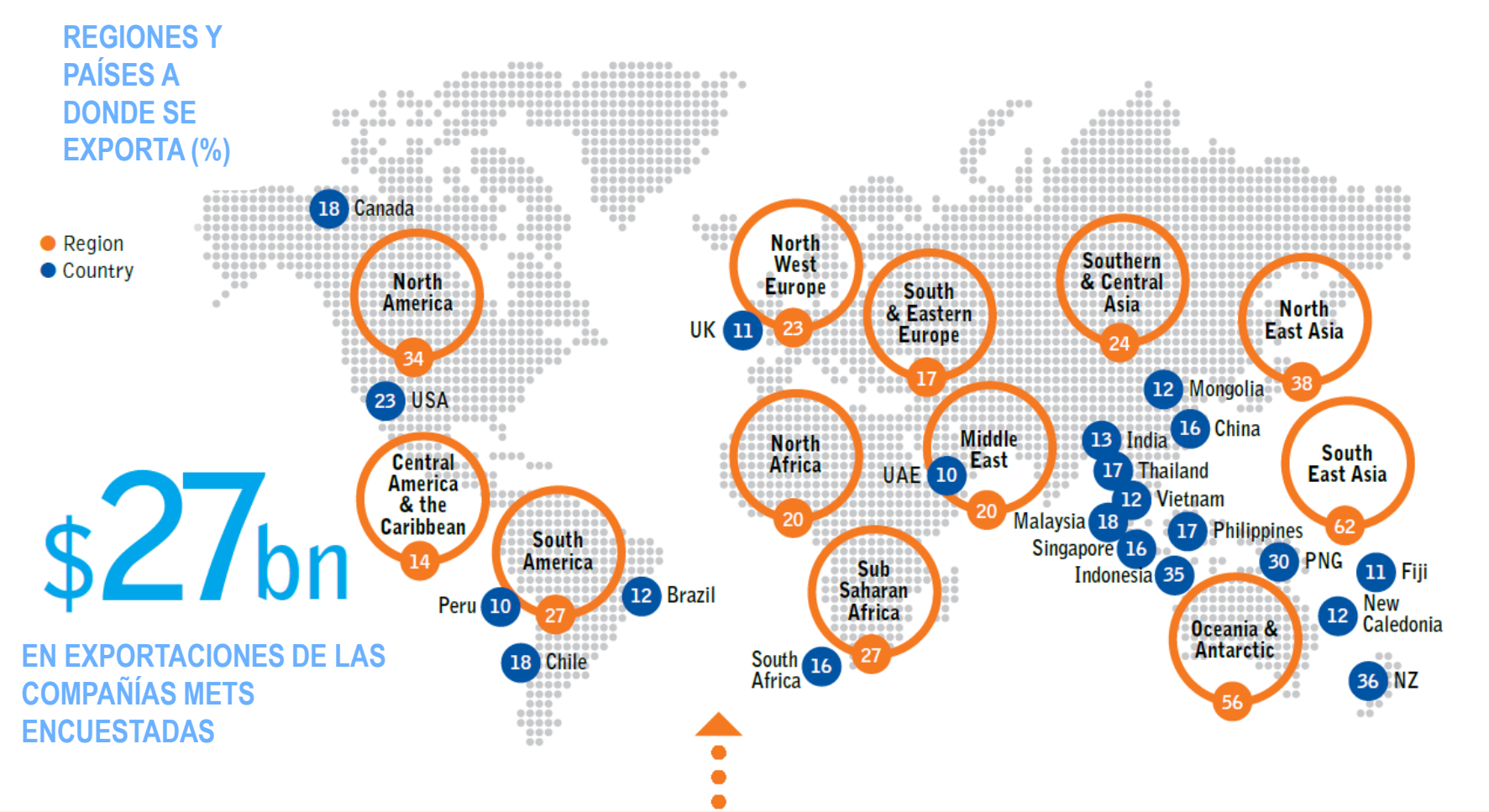
Fuente: Rayner & Bishop, Reserve Bank of Australia, 2013

La industria minera y de exploración australiana ya es internacional - como la dimensión de negocios de los intereses estratégicos de Australia



Fuente: SNL Metals and Mining / ASX 2013

Las empresas METS australianas son ahora importantes exportadoras de equipos, tecnología y conocimiento



Fuente: Austmine 2013

Australia and its States and Territories

'A nation of colonies'

'The lucky country'

Government in Australia

- Consists of:
  - Commonwealth
  - States (six plus two Territories)
  - Local Government
- Government responsibilities:

Commonwealth: international obligations and treaties; uranium mining; environmental issues of *national significance*; indigenous issues and Native Title; corporations law; tertiary education

State: mineral leases; environmental (including social) assessment, approvals and regulation; mining operational aspects (e.g. health and safety); water policy and regulation; regional planning; infrastructure; mineral royalties; education and training

Local: provision of services; local planning and approvals

Coordinated: investment attraction; minerals and energy policy; water policy; environmental assessment and approvals; local content

Mining-relevant government departments

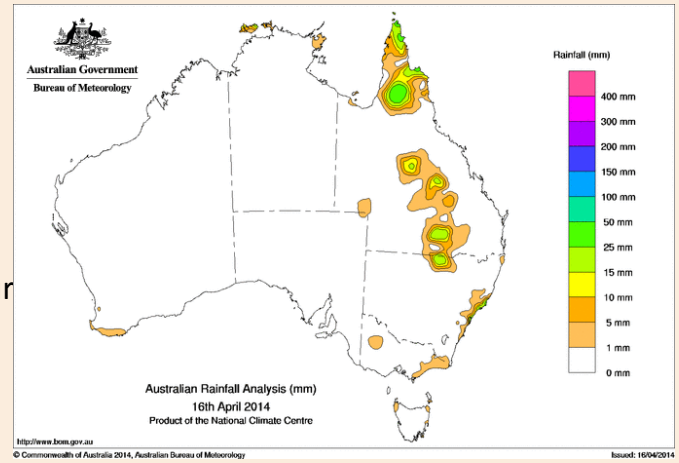
- Australian Government
  - Department of Industry (industry policy, geoscience, offshore petroleum, uranium)
  - Department of the Environment (environment assessments and approvals for matters of national significance)
  - Department of Education (universities)
  - National Water Commission (coordination of water policy and management)
  - Infrastructure Australia (coordination and prioritisation of infrastructure)
- State example - Queensland
  - Department of Natural Resources and Mines (exploration, mining, oil and gas – promotion and regulation)
  - Department of Environment and Heritage Protection (project assessment and approvals; regulation and oversight
  - Department of State Development, Infrastructure and Planning (investment attraction and coordination, major projects, infrastructure)
  - Department of Education, Training and Employment (Vocational education and training)
  - Department of Energy and Water Supply (water management and regulation)
- State example - Western Australia
  - Department of Mines and Petroleum (exploration, mining, oil and gas – promotion and regulation)
  - Environmental Protection Authority (project assessment and approvals)
  - Department of Environment and Conservation (operations regulation and oversight)
  - Department of State Development (investment attraction and coordination, major projects, infrastructure)
  - Department of Training and Workforce Development (VET)
  - Department of Water (water management and regulation)

Water, mining and agriculture

- Australia is the second driest continent on Earth
- The Australian mining sector uses 4% of national water resources
  - but can be a significant water user at a local and regional level
  - coal seam gas production will increase water usage in agriculture regions
- Agriculture uses 65% of national water resources
  - any increase in agricultural production is constrained by water availability

Water management in Australia (1)

- Australia is the second driest continent on earth
  - In several regions, we have a drying climate
- Three of the largest sectors of the economy – mining, energy and agricultur are water intensive
  - The community also uses a lot of water
- The world has an interest in how Australia manages its water
  - Global food security and energy security are connected to water security
- Need to understand the full value of water to industries and communities
  - A vital input to economy and lifestyle
- Need to use water efficiently and allocate it to highest unit value uses



Water management in Australia (2)

Poor water management in the past has led to poor outcomes

- Decisions based on poor information - not understood the consequences
- Inconsistent water planning between jurisdictions and between user sectors
- Over-allocation of water so that more is used by agriculture, mining and communities than is sustainably available
- Poor management of streams, groundwater and land: pollution, land degradation, ecosystem damage
- Low understanding of links between different water sources, of interactions of water with energy, vegetation and types of agriculture; and cumulative impacts of activities

Water management in Australia (3)

- We have learned a lot, applied the lessons, taken difficult decisions and innovated
  - Now on the journey to achieving sustainable water management
- National Water Initiative (2004): Australia's roadmap for national water reform
  - Improves water planning, management and allocation to benefit all – ecosystem, communities, industry, economy
  - NWI principles: valuing water, preserving it, trading it, using it efficiently and seeking maximum utility from it
  - 70 reform actions to manage water sustainably for all users
  - Provides greater certainty and transparency, and builds trust
- Key features
  - Promotes integrated management
  - Water allocation plans
  - Secure water access entitlements
  - Water markets and trading
  - Regulatory arrangements that are clear, transparent and efficient, and set out roles and responsibilities

Water management in Australia (4)

- National Water Initiative is well accepted and trusted by stakeholders
  - Reassures the public and other sectors that sectors can operate safely, appropriately and bring benefits without harm
- National Water Commission has drawn two key lessons:
  - Water needs to be managed by cooperative action among a wide range of parties whose interests will not always be aligned.
  - Single integrated management framework:
    - provides a connecting point for competing users
    - works across boundaries of jurisdictions
    - works across sectors

Australian mining industry and water

- Mining industry uses innovative and sophisticated technologies in management systems, recovery, recycling and beneficial use and re-use of waters
- Uses ~~a~~ risk management approach to ensure that climate variability is factored into planning
- But the industry needs to better understand water and its critical value to all parts of its business
- Community and other users have misapprehensions about the impact of mining on water – 2006: *Strategic Water Management in the Minerals Industry* promotes a strategic approach to water management so that water is better managed and valued as a vital asset for all
- 2014: *Water Accounting Framework* for the mining industry: consistent and transparent approach to measurement

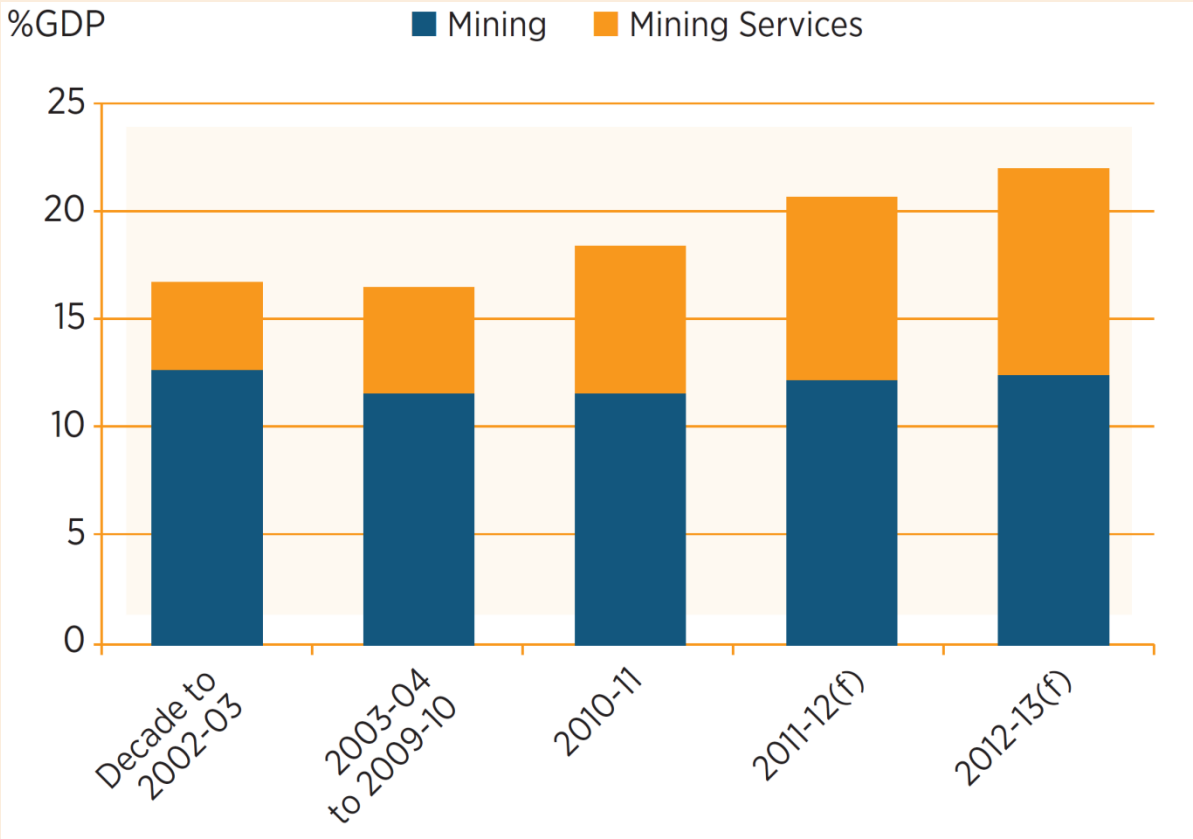
Australian agriculture and water

- Australia already produces enough to feed around 60 million people each year, and exports around 55% of food production
  - But any increase requires better use of water
- Off-farm irrigation infrastructure improved to reduce water losses – eg, pipelines to replace canals
- On-farm irrigation infrastructure in Australia more efficient and innovative – eg, drip irrigation, soil moisture monitoring
- Agricultural practices improved and new crop varieties introduced
- Water pricing promotes efficient use and facilitates water allocation buy-backs

Mining project assessment, approval, regulation and impact management

- Environmental and Social Impact Assessments – fully transparent; draft reports open for comment; final reports respond to comments
- Economic Impact Assessments are optional but usual for major projects
- Environmental Management Plans for all projects
- Social Management Plans for major projects
- Australian Industry Participation Plans for major projects

GDP contribution of Mining Equipment, Technology and Services (METS) sector has grown faster than mining's



METS output is growing at 15 to 20% a year

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

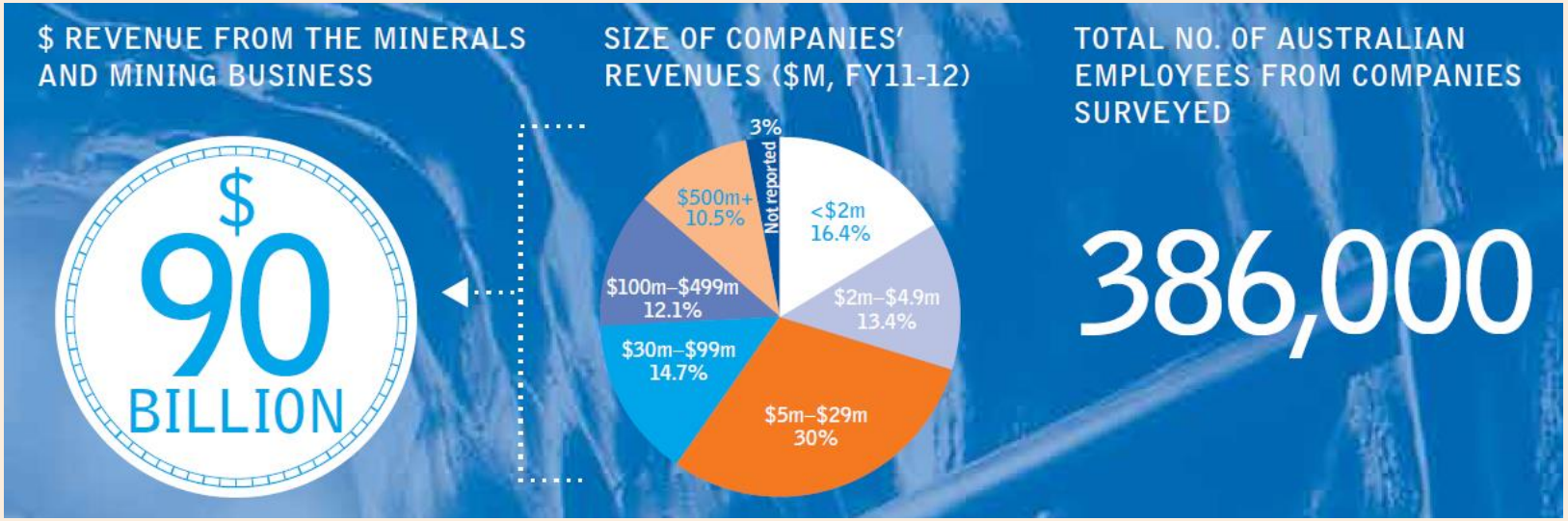
METS contribution to *GDP*

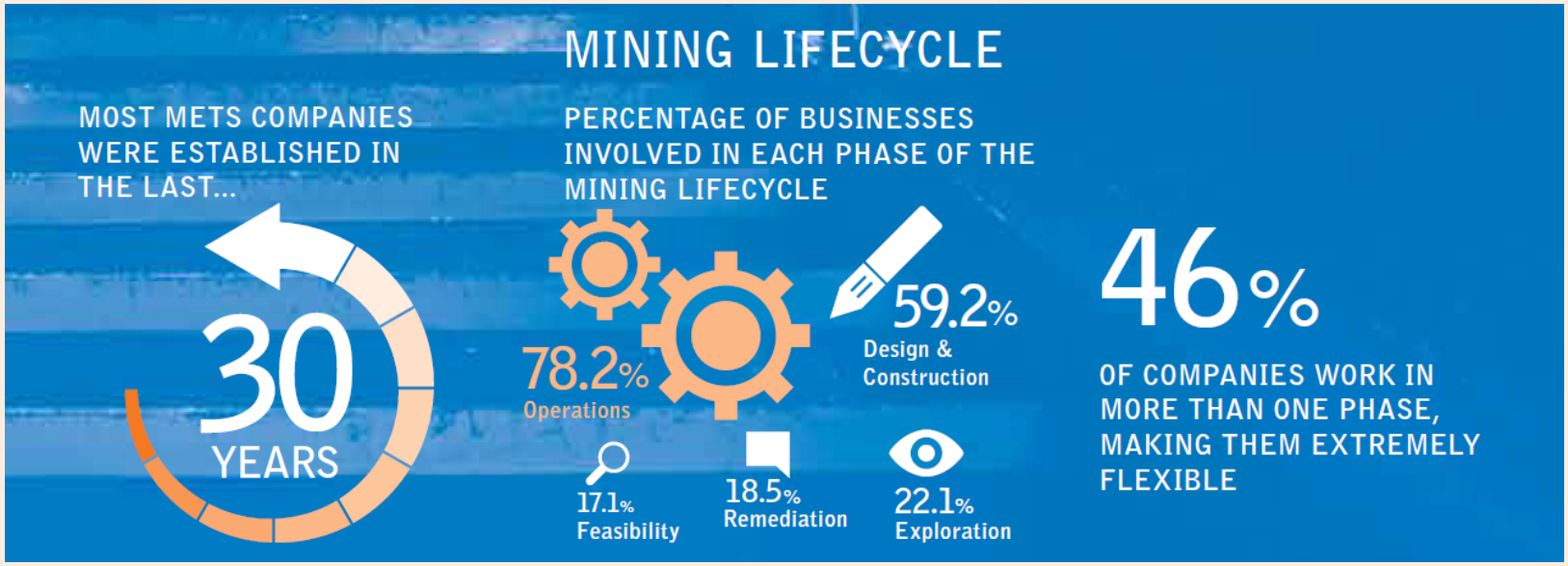
- 6.7% in 2010-11
- Est. 9.4% in 2012-13

Many METS are knowledge- and technology-intensive

Source: Australian Treasury and Ed Shan / Minerals Council of Australia 2012

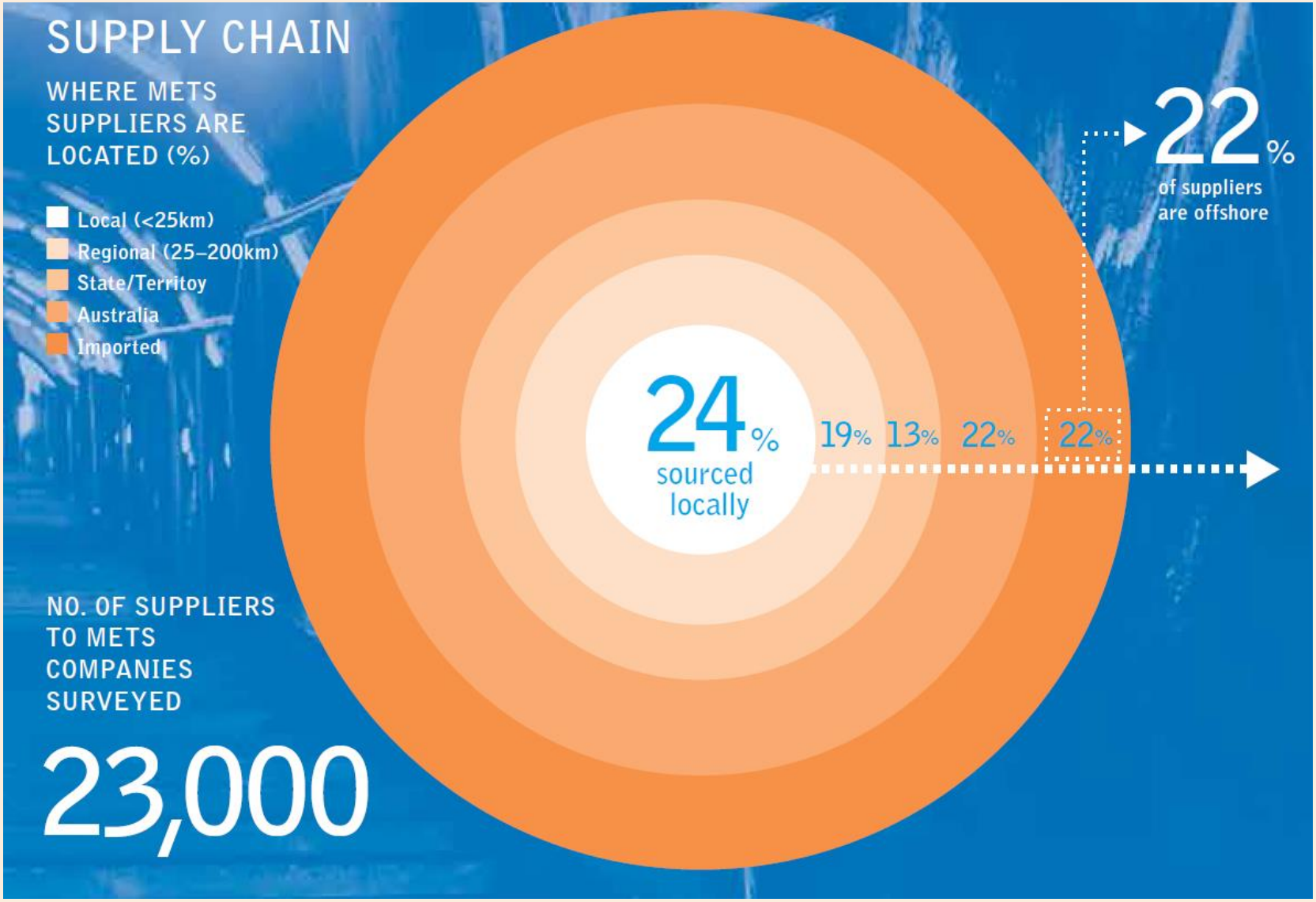
METS is now a very important industry sector to Australia





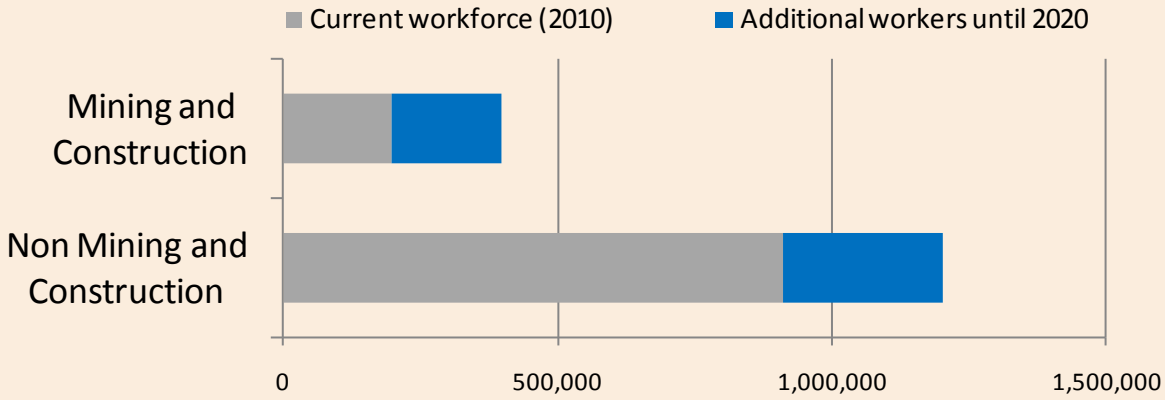
Source: Austmine

…with deep links into the economy

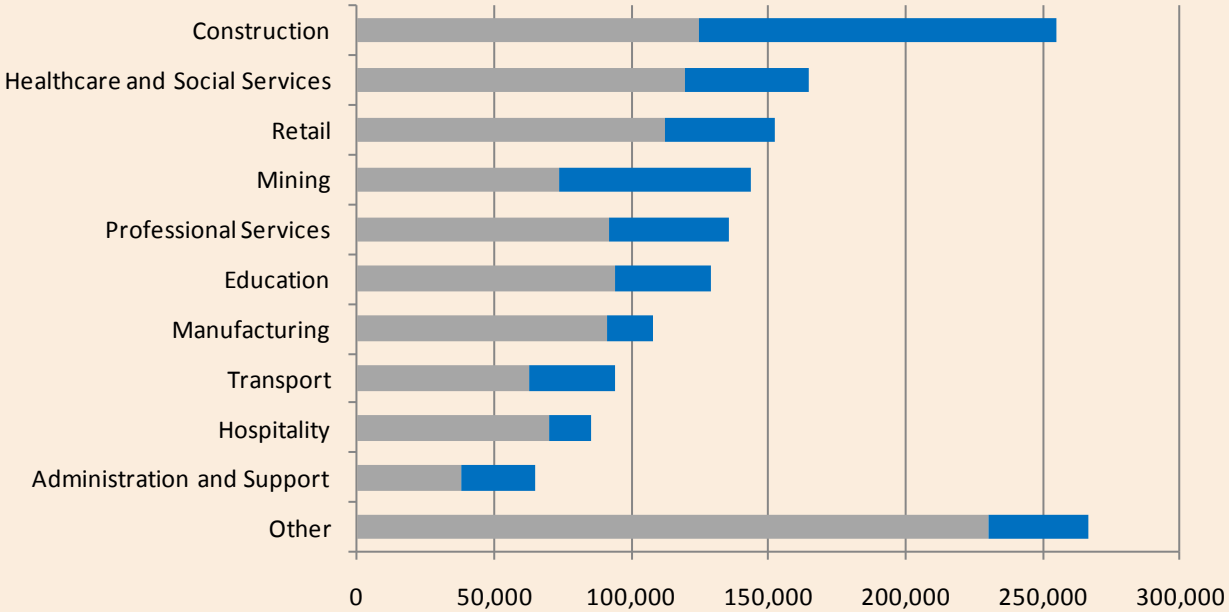


Source: Austmine

Employment growth: driven by mining, but more than just mining jobs – Western Australia example



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 from mining operation

Direct

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

Indirect

Local manufacturer or service provider

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

Local dealer

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

Induced

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

- 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 (Central) Bank

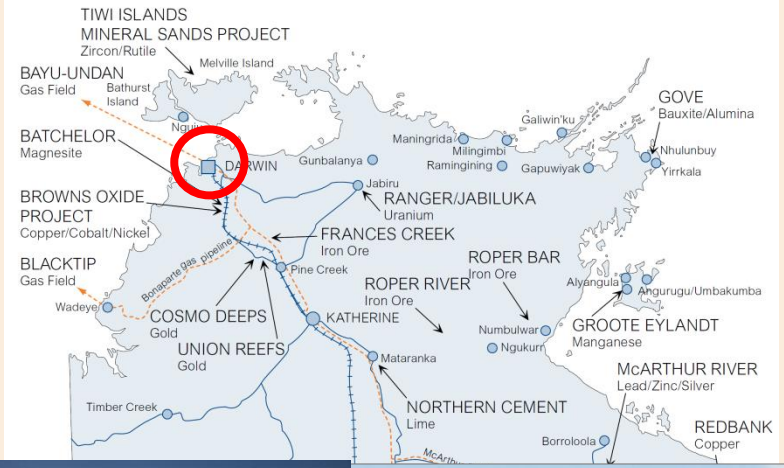
Adapted from Saipem 2011

Case study: Kalgoorlie, Western Australia

- Mining town since 1900s –
  - Gold, nickel sulphide and nickel laterite – long life operations and evolving industry
- 600 km east of Perth
- Region's population 45,000
- Mining services developed initially because of remoteness
- Strong regional METS clusters (sectoral and geographic)
  - ~200 manufacturing & services sites
- Now a net 'exporter' of mining equipment and services to other locations

Case study: Darwin, Northern Territory

- Australia's most northern and isolated city
  - Major service centre for mining, oil and gas, defence and marine sectors
- Population 110,000
- Mining services developed initially because of remoteness
- Now has a competitive advantage in mining and petroleum services
- Strong regional METS clusters (sectoral and geographic)
  - ~300 manufacturing & services sites
  - Collaborative business culture
- Exporter of METS to other locations, including Indonesia

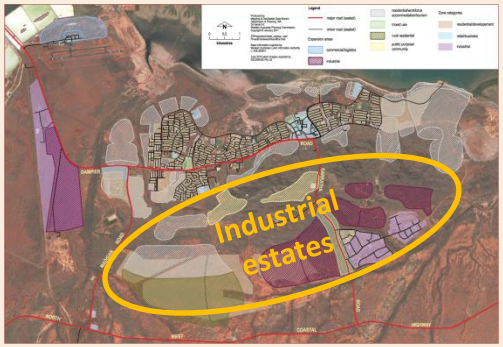


Kalgoorlie and Darwin: Factors of success

- Long-life customer mining/petroleum operations ; diverse markets (Darwin – sector diversity; Kalgoorlie – geographic diversity)
- Good business and community infrastructure: serviced industrial land, roads, energy, water, community
- Skilled resident workforce; sustainable demographic profile; attractive town amenity
- Education and training institutions: public and private secondary schools, and vocational training and education; universities / school of mines (Kalgoorlie)
- Strong entrepreneurship culture, support networks, business services
- Financial institutions that understand mining and services
- Supportive, light-handed government interventions, eg: industry participation policies; partnerships with business to connect customers and suppliers; small business support

Kalgoorlie and Darwin: overcoming obstacles

- Collaborations to overcome small scale and lack of capacity
- Right size contracts and alliances to help build local firms
  - some operations have adopted 'inside-out' strategies to help employees become independent services suppliers
- Revise e-procurement and payment processes for small firms
  - companies offer access to global supply chains for good performers
- Government-business partnerships to build supplier-customer linkages, eg
  - Australian Industry Participation National Framework
  - Industry Capability Network; Project Connect
- Infrastructure to support business
  - Government investment and facilitation of business infrastructure through PPPs

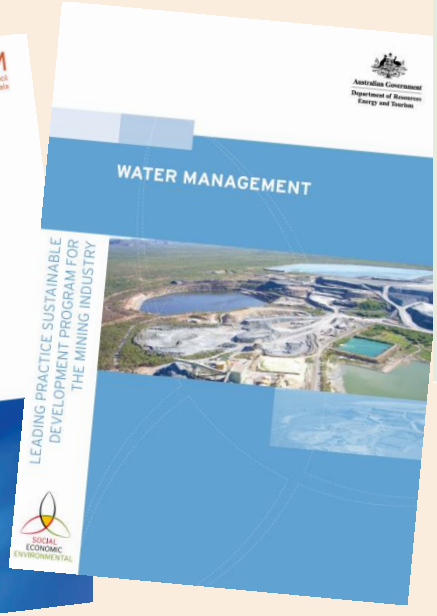


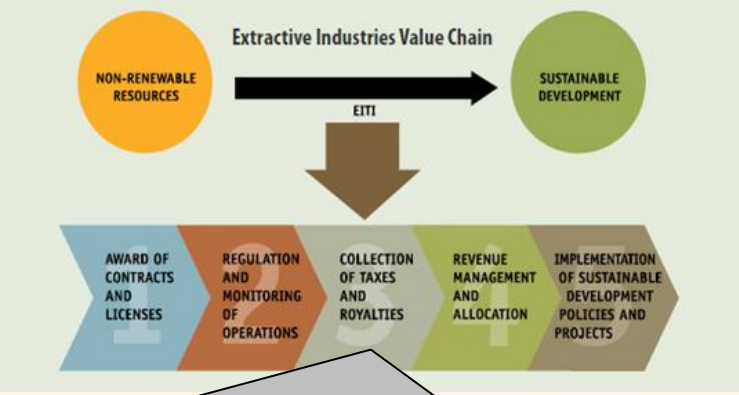
People are Australia's most important asset

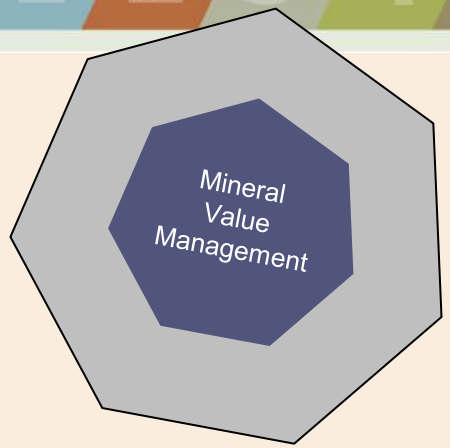
Focus on attracting, developing and retaining high-quality talent, not just a focus on hard infrastructure

Education and training institutions: key infrastructure assets	• Crucial to dealing with challenges and opportunities of the 21st Century • Advanced education integrated with research
Complementary to traditional infrastructure	• Knowledge-intensive and knowledge creating • Adaptable and capable to deal with uncertainty and to engage with the emerging new global economy
Public sector and industry collaboration	• e.g. Technical colleges; SKM Learning Centre, GE Energy Learning Centre; University research and teaching centres (Rio Tinto, BHP, Chevron, Shell) • Knowledge spillovers: trained workers move between projects and firms, taking skill set and culture with them

Integrated policy on industry, education and training





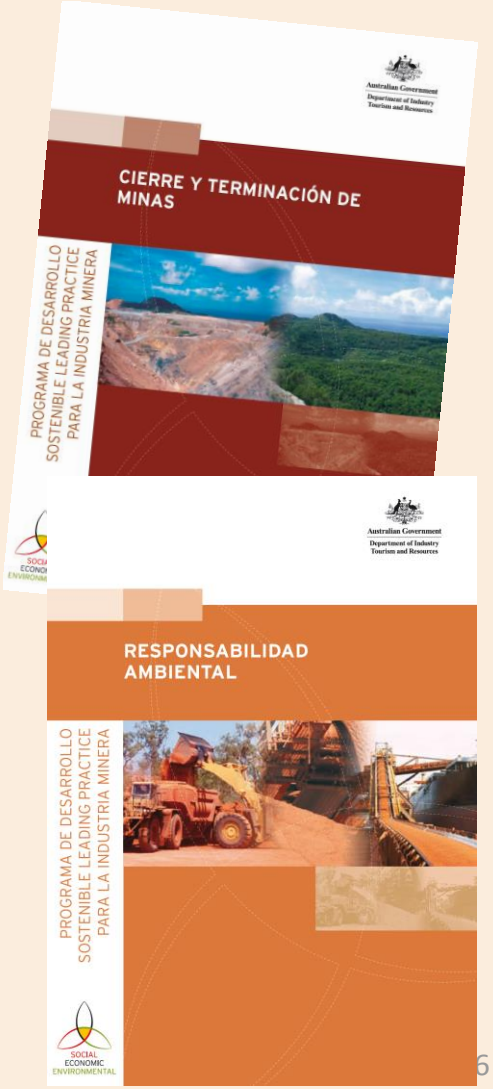


Some tools to guide sustainable mining

Leading Practice Sustainable Development Program for the Mining Industry – Australian Government

Los siguientes manuales están disponibles en español:

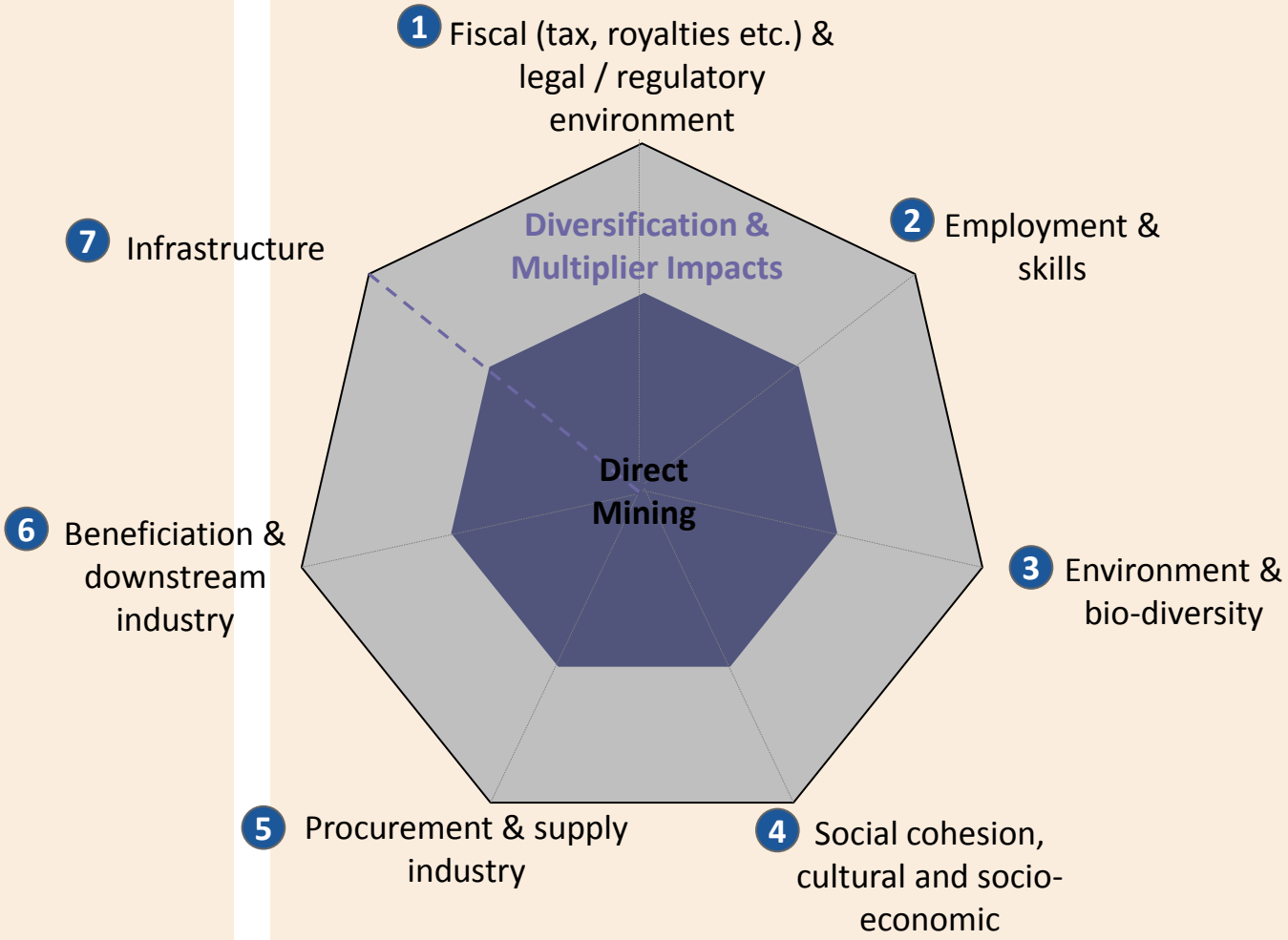
- Compromiso y Desarrollo con la Comunidad
- Cierre y Terminación de Minas
- Rehabilitación de Minas
- Responsabilidad Ambiental
- Trabajar con Comunidades Indígenas
- Gestión Hídrica
- Guía Para el Desarrollo de Prácticas Innovadoras Sostenibles en la Minería



Mining: Partnerships for Development Toolkit - International Council on Mining and Metals (ICMM)

- Systematic and objective way to quantify and agree ways to enhance mining's economic and social contribution

'Mineral Value Management' tool tests expectations across 7 dimensions of value: World Economic Forum

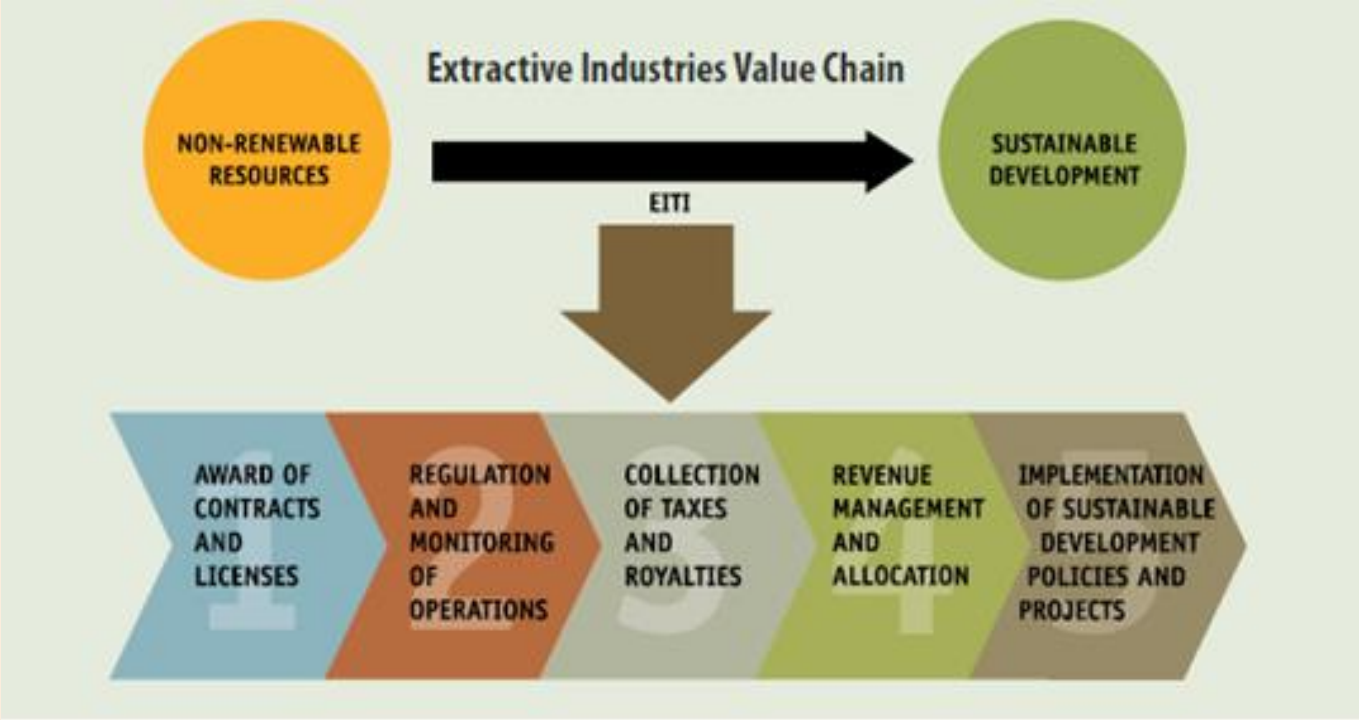


Value driven by 2 types of factors

Structural	Inherent nature of a country & its resource base and the extractives industry
	Country's current stage of economic development and maturity of minerals industry
Enabling	Structure & capacity of government and institutional environment
	Capacity & willingness of private sector
	Levels of trust & collaboration and influence of stakeholders

Source: World Economic Forum

World Bank Extractive Industries Value Chain Framework



Fair contracts
The benefits of mineral resources will remain elusive if governments and mining companies strike deals that are one-sided and narrowly focused

Responsible conduct of mining
Even the benefits of fair contracts can be undone if mining is allowed to be conducted irresponsibly

Optimal use of resource wealth
Ultimately responsibility falls on the Government to ensure that citizens are better off because of minerals are harnessed for sustainable development

Source: World Bank

Contact

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