2015-2025
Western Australian Resources Sector Outlook

CME
Deloitte Access Economics
This Outlook finds the sector is now largely in the operational phase as previously forecast. Major construction projects are now either being completed or will be finalised over the next couple of years. This will see a further decline in the overall workforce, particularly construction, however exports are expected to increase placing ongoing pressure on the state’s infrastructure.

At the same time the value of projects currently under consideration is substantial, and we can’t afford to be complacent. For these projects to proceed, all governments need to work with the sector to ensure the state’s policy environment remains internationally competitive and attractive to new investment.

Throughout the last year the price of a number of key commodities has been weaker, requiring the continued focus on reducing the cost of doing business. The sector is working to ensure operations become more efficient and this Outlook forecasts improvements to labour productivity.

The future will see a continued need for a fly-in fly-out (FIFO) workforce during the operational phase, providing choice for employees and to meet the sector’s need for skilled labour. The majority of the FIFO workforce will be sourced from the Perth – Peel region with these employees primarily flying to the North-West of the state. Importantly FIFO is also occurring from regional centres, helping to sustain local communities.

The sector’s energy demand will continue to increase with a transition from the use of diesel towards natural gas, and a reliance on self-generated electricity in areas outside of the South West Interconnected System. We are also likely to see total energy intensity per unit of production fall as operations become more efficient and exports increase.

Water abstraction is forecast to increase, driven by demand for water for mine operations and dewatering. The increasing volume of water abstracted for dewatering is expected to be highly volatile and needs to be considered against the reliability of supply required for other uses.

The state’s aviation infrastructure is expected to remain under pressure over the long term, as passenger movements through Perth and regional airports are forecast to increase. Forecast increases in export tonnages through our ports and freight movements on our roads will also require a continued focus on port and road infrastructure.

This Outlook also provides a qualitative examination of the provision and quality of social infrastructure not provided by resources sector companies. It finds health and counselling services are expected to require greater investment in the future.

We’ve reviewed our previous Outlooks, developed in 2013 and 2011, and found the trends in our forecasts have largely been accurate. However, changes in commodity prices have seen fewer people employed in the sector and slower development in the Mid West region.

This Outlook is based on a survey of the development intentions of individual resources sector companies and brings together government policy supply side settings. I would like to thank all contributors to the Outlook, including CME members and government agencies, for their assistance in developing an integrated outlook for the future.

The value of the state’s resources sector continues to grow and is a reminder of the economic importance of the sector to our community. Realising the next wave of resources sector investment will require stable and sensible policy settings.

Reg Howard-Smith
Chief Executive
About

THE CHAMBER OF MINERALS AND ENERGY OF WESTERN AUSTRALIA

The Chamber of Minerals and Energy of Western Australia (CME) is the leading advocate for the Western Australian resources sector. CME exists to champion the Western Australian resources sector and assist it in achieving its vision to be innovative and competitive and deliver value to the community and investors while underpinning Australia’s economy.

CME represents companies directly involved in the resources sector (including mining, oil and gas) and those which provide supporting services. CME’s member companies generate 95% of all mineral and energy production by value and employ over 80% of the resources sector workforce in the state.

DELOITTE ACCESS ECONOMICS

Deloitte Access Economics is Australia’s pre-eminent economics advisory practice and a member of Deloitte’s global economics group. With more than 120 professionals, Deloitte Access Economics is Australia’s largest team of private sector economists. Deloitte Access Economics offer a full suite of macroeconomic and microeconomic advisory services, including economic and financial forecasting and modelling, as well as policy analysis, and regulatory consulting. Deloitte Access Economics also provides tailored, practical commercial advice to clients, and makes available our economic forecasts through our subscription publications.

DISCLAIMER

This publication is provided as general information only and does not consider anyone’s specific objectives, situation or needs. You should not rely on the information in this publication. Deloitte Access Economics Pty Ltd and CME do not accept any duty of care or liability to anyone regarding this publication or any loss suffered in connection with the use of this publication or any of its content.

Authorised Use © 2014, Deloitte Access Economics Pty Ltd

This publication contains proprietary information of Deloitte Access Economics and CME. All of the material in this publication is for the exclusive use of CME and may not be otherwise used or modified for or by any other person or sold to or otherwise provided in part to any other person or entity without the prior written consent of Deloitte Access Economics or CME.

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Liability limited by a scheme approved under Professional Standards Legislation.

Member of Deloitte Touche Tohmatsu Limited.
The 2015-2025 Western Australian Resources Sector Outlook provides an integrated outlook based on the development intentions and plans of the Western Australian resources sector.

First published in 2009, with updated editions in 2011 and 2013, the Outlook is a key advocacy document forecasting change within the sector, and is used to inform government policy and assist corporate planning and investment decisions.

This edition identifies key policy implications and opportunities which need to be considered in the context of a sector transitioning from a construction to production phase.

The Outlook brings together the resources sector to identify and promote innovative ways to facilitate planning, investment and delivery, particularly on the key enablers:

- People
- Energy (electricity and natural gas)
- Water
- Infrastructure (aviation, ports, road, rail and social).

The objectives of the Outlook are to:

- Provide an integrated supply and demand outlook across Western Australia, and at the regional level, on the key enablers.
- Examine changes to the structure and composition of the workforce and productivity.
- Examine energy requirements in relation to electricity and natural gas.
- Examine water abstraction and changes in sources and destination.
- Examine infrastructure requirements and bottlenecks.
- Analyse the policy implications with a particular emphasis on the opportunities and challenges.
- Provide input into government planning to improve regulatory and policy regimes.

In developing the Outlook CME partnered with Deloitte Access Economics.

A comprehensive process was undertaken to bring together the demand profiles of the sector as well as the supply side policy settings.

A survey of resources sector companies and analysis of publicly available information and modelling was undertaken to forecast future demand profiles. In parallel, a detailed assessment of the supply outlook was considered and validated through industry and government reference groups.
The resources sector workforce is expected to decline through to 2025 as we transition from the construction to the operational phase, with an ongoing focus on productivity.

OVERVIEW
- The resources sector workforce is expected to decline from 105,200\(^\text{1}\) in 2014 to 87,000 by 2025.
- While lower than current numbers, the resources sector workforce will still be approximately double that of pre-expansion levels in 2004.
- Labour productivity in the production phase is expected to increase by 40% to 2017 and then plateau to 2025.
- The share of women in the resources sector workforce is forecast to increase by 1.5% by 2020.
- The share of Aboriginal people in the resources sector workforce is forecast to increase by 2.3% by 2020.

COMPOSITION OF THE WORKFORCE
- In 2014, the proportion of residential workers in the construction phase was 13% of the workforce. This is expected to increase to 25% of the overall workforce in 2020.
- The proportion of residential workers in the operational phase is expected to decrease to 37% in 2020, from 40% in 2014.
- The proportion of FIFO workers in the operational phase is expected to increase to 63% in 2020, from 60% in 2014.
- The Perth and Peel regions contributed 70% of the FIFO workforce in 2014. A further 3% of the FIFO workforce is expected to come from this region in 2020.

1 Average headcount of ABS quarterly labour force numbers in 2014.
THE REGIONS

• The workforce in the Pilbara is expected to decrease by 14,300 workers by 2020, comprising a reduction of 17,900 construction workers and increase of 3,600 operational workers.

• The workforce in the Goldfields-Esperance region is expected to decrease by 900 workers by 2020, comprising a reduction of 700 construction workers and 200 operational workers.

• The workforce in the Kimberley is expected to increase by 2,900 to 2020.

• Workforces in the Mid West, Great Southern and South West are expected to remain relatively constant through to 2020.

IMPLICATIONS AND OPPORTUNITIES

• The transition from the construction to the operational phase will decrease the construction based workforce.

• The significant growth in the workforce over the past decade will not be unravelled by the current shift from the construction to the operational phase. Rather, the workforce is forecast to remain more than double pre-expansion levels.

• Accommodating the future workforce will require both FIFO and local residential options.

• New strategies will be required in the future to continue the momentum created in recent years in increasing the representation of women in the resources sector.

• Operational labour productivity is projected to increase significantly over the short term. Over the medium term labour productivity will plateau and needs to improve if the sector is to continue to compete effectively on the world stage.
Energy consumption in the resources sector is forecast to continue to grow – incremental changes in demand will see natural gas replace diesel as the main energy source.

Primary Energy

OVERVIEW

- Primary energy consumption in the resources sector is expected to grow from 223 petajoules (PJ) in 2013 to 267 PJ by 2025, representing an annualised rate of growth of 1.5%.
- Diesel consumption will increase by 20 PJ between 2013 and 2016 before declining to 14 PJ above 2013 levels in 2020.
- Natural gas consumption will increase by 41 PJ above 2013 levels in 2020.
- The forecast increase in gas consumption suggests tight market conditions could emerge in the medium term.

THE REGIONS

- An additional 61 PJ of energy is forecast to be consumed in the Pilbara by 2020.
- Energy consumption in the Goldfields-Esperance region is forecast to increase by over 2 PJ between 2013 and 2016 before declining to 7 PJ below 2013 levels in 2020.
- Energy consumption in the South West is expected to remain steady out to 2020.
Electricity

OVERVIEW

- Electricity consumption in the resources sector is forecast to grow from 11,712 gigawatt hours (GWh) in 2013 to 17,340 GWh by 2020, representing an annualised rate of growth of 5.7%.
- Electricity consumption in the resources sector represents 73% of the state’s forecast electricity growth by 2020.
- Self-generated electricity is forecast to rise by over 3,330 GWh by 2020, or around 60% of the state’s forecast electricity growth.
- The use of diesel in self-generated electricity is forecast to decline from 16% of total generation in 2013 to 9% in 2020.
- The use of natural gas in self-generated electricity is forecast to increase from 82% of total generation in 2013 to 87% by 2020.
- Purchased electricity is forecast to grow by 2,300 GWh by 2020.

THE REGIONS

- Electricity consumption in the Pilbara is forecast to increase by over 4,000 GWh by 2020 accounting for 72% of the projected incremental demand.
- Electricity consumption in the Kimberley (613 GWh), Mid West (521 GWh) and Goldfields-Esperance (441 GWh) regions is forecast to increase by 11%, 9% and 8%, respectively, of the projected incremental demand by 2020.
- Electricity consumption in the South West is forecast to remain constant, as a percentage, through to 2020.

IMPLICATIONS AND OPPORTUNITIES

- The energy mix in the resources sector over the medium term will change from diesel to natural gas.
- Significant forecast growth in natural gas consumption in Western Australia supports the development of onshore gas resources.
- Electricity consumption is forecast to increase in the Pilbara, with growth underpinned by self-generation and purchased sources.
- The Electricity Market Review may have important implications for industrial users in the South West Interconnected System.
Water abstraction in the resources sector will continue to increase, largely for mine operations and dewatering purposes.

OVERVIEW

- Water abstraction in the resources sector is forecast to increase from 530 GL in 2013 to 692 GL by 2020, an increase of 31%.
- Groundwater dewatering is forecast to be the largest source of water abstracted in 2020 and is forecast to be 115 GL higher than 2013 levels, a 35% increase.
- Groundwater reinjection is forecast to increase by 55 GL to 2020, a 50% increase.
- Water use for mine operations will increase by 60 GL to 2020, a 30% increase.

Groundwater dewatering is forecast to increase 35% above 2013 levels to 2020.

Water use for mine operations is forecast to increase 60 GL while groundwater reinjection is forecast to increase 55 GL to 2020.

RESOURCES SECTOR WATER ABSTRACTION

Source: Resources Sector Outlook Survey, Department of Water
THE REGIONS

- Resources sector water abstraction in the Pilbara is forecast to increase from 350 GL in 2013 to 491 GL in 2020, an increase of 141 GL or 40%.
- Groundwater dewatering in the Pilbara is expected to be 404 GL in 2020, an increase of 122 GL on 2013 levels, and will account for 82% of all water abstracted.
- Water abstracted by the resources sector in the Pilbara in 2020 will largely be either reinjected (207 GL) or used in mine operations (193 GL).
- Water abstraction in the Goldfields-Esperance region is expected to peak in 2015, from 100 GL in 2013 to 103 GL, and then decline to 102 GL in 2020.

IMPLICATIONS AND OPPORTUNITIES

- Water scarcity will require market mechanisms to efficiently allocate supply, where markets are possible.
- The volume of dewatering surplus to mine needs may provide a supply for beneficial purposes, but volatility of supply and water quality are key constraints which will impact the viability of options.
- Cumulative effects remain a priority issue, but further work is needed to ensure an appropriate management framework is developed.
The state’s infrastructure is forecast to continue to be under pressure as the resources sector transitions into the operational phase.

**AVIATION**
- By 2020, resources sector passenger movements through Perth Airport are forecast to be 313,000 above 2014 levels.
- Despite a projected smaller resources sector workforce by 2020, resources sector passengers utilising Perth Airport are forecast to increase due to shorter shift patterns during the operational phase.
- Over the longer term, demand for departure times from Perth Airport is expected to remain between 6:00 am and 9:00 am from Monday to Thursday. Arrival times will similarly be maintained over the longer term, after 3:00 pm from Tuesday to Thursday.

**PORTS**
- Resources sector exports are forecast to increase by 534 million tonnes per annum (Mtpa) by 2020, representing an 80% increase on Western Australia’s entire seaborne freight volume in 2012/13.

**RAIL**
- The regional freight task of the Brookfield rail network is forecast to increase from 75 million net tonnes per annum in 2012 to more than 130 million net tonnes per annum by 2030.2

---

**PERTH AIRPORT RESOURCES SECTOR PASSENGERS, INCREMENT ON 2014 LEVELS**

**RESOURCES SECTOR EXPORT VOLUME, INCREMENT ABOVE 2013 LEVELS**
ROADS

- Freight moving into, within and out of the state’s regions is forecast to increase from 24 billion tonnes per kilometre (tkm) per annum in 2012 to 40 billion tkm by 2030.\(^2\)
- The expansion of mines and development of processing plants and industrial estates along the Pilbara coast will place pressure on the existing road network.
- The Great Northern Highway and North West Coastal Highway will continue to be integral parts of the road network.

SOCIAL INFRASTRUCTURE\(^4\)

- Provision of regional health services (including clinics, hospitals and pharmacies) and counselling services needs to continue to grow in the future in terms of service offering and quantity, particularly in the Pilbara and Kimberley.
- Provision of emergency services (including fire, police and ambulance services) was perceived to be adequate, with some regional outliers.

IMPLICATIONS AND OPPORTUNITIES

- A sound business case for determining investment at Perth Airport is required as resources sector passengers are forecast to increase over the medium term due to shorter operational rosters.
- Investment in regional airport infrastructure must keep pace with investment at Perth Airport to avoid transferring bottlenecks to the regions.
- Some regional airports in Western Australia hold national significance and would benefit from being operated by the private sector.
- Additional port capacity will be required in the Pilbara in the medium term.
- There is room for improvement in infrastructure planning in Western Australia, while fiscal constraints also require new ways of funding infrastructure.

---

\(^2\) Western Australian Regional Freight Transport Network Plan
\(^3\) Western Australian Regional Freight Transport Network Plan
\(^4\) This Outlook sought views from the resources sector in terms of the provision of non-company social infrastructure in areas nearby to projects. The responses are a qualitative perception of the resources sector.
The Way Forward

Over the last 10 years there has been unprecedented growth in both state and national economies, driven by the resources sector. The Outlook forecasts a transition to the operational phase and an increase in exports over the forecast period.

The sector faces a number of issues in the future, including uncertain market conditions and growing activism, which need to be addressed to ensure a pipeline of projects in the future.

Encouraging greenfield exploration, a continual and sustained focus on productivity, and improving investment attractiveness should be the basis for governments and the sector to develop and shape appropriate policy settings.

A structural shift was evident throughout 2013 and 2014 as investment-led growth in the resources sector transitioned to export-led growth. With this change, different demands and constraints have been placed on company budgets. There has been a rationalisation in the resources sector as a result of weaker prices for a number of key commodities, high production costs, and scaling back of projects and investment.

The trends forecast in the 2013 Outlook have generally been accurate. However, the 2015-2025 Outlook highlights some changing nuances for the key enablers requiring revised policy responses.

The resources sector workforce has more than doubled since 2004, however numbers have declined over the past 12 months as the sector transitions to the operational phase. There will be a further contraction over the medium term although the significant growth in the workforce over recent years will not be unravelled by the shift to the operational phase.

FIFO will continue to be an attractive workforce model, providing choice for employees. Policy responses should continue to strike a balance between FIFO and the need to invest in social infrastructure in regional areas to attract and retain skilled residential workers.

In response to uncertain market conditions, and as the construction phase slows, there has been a strong push to improve productivity. The sector is focusing on job design, improving leadership and management capabilities, and looking at the role of automation in the sector. To ensure labour productivity increases, the industrial relations regime needs to be reformed to address cost pressures.

Self-generated electricity consumption will remain the key source of electricity, however purchased electricity is forecast to also increase in a capital constrained environment. This presents partnership opportunities between electricity suppliers and users. Natural gas will replace diesel as the main energy source providing opportunities for local producers.

Water abstraction will increase, largely for dewatering and mine operational needs. While dewater surplus to mine needs may provide a supply for beneficial purposes, significant volatility of supply and water quality will be a key constraint to diversifying industry in regional areas.

While the government has a vision for the state, as outlined in the State Planning Strategy, effective processes need to be in place to facilitate further port, aviation and road infrastructure, and to ensure the protection of industrial buffers and corridors. Complex planning processes across all levels of government can delay coordinated development and need to be reviewed.

There is more than $52 billion worth of projects either committed or under consideration. Recognising the fiscal constraints facing governments, appropriate investment structures need to be put in place to ensure the development of these projects. This will assist to address budgetary concerns and provide economic and social benefits to the broader economy.

5 Deloitte Access Economics Investment Monitor – September 2014
Recommendations

- FIFO work arrangements must be supported by governments, and resources sector companies must continue to engage with communities to demonstrate the opportunities these arrangements provide for employees who choose to work in the sector in remote areas.

- Governments and the resources sector must work in partnership to ensure productivity is maximised through to 2020.

- The resources sector must continue its focus on diversity in employment, particularly women and Indigenous people, to ensure it is an employer of choice.

- A state infrastructure plan should be collaboratively developed by the government and the private sector and include a prioritisation of the state’s economic and social infrastructure needs.

- An arms-length body should be established to advise on infrastructure strategies for the state and improve the level of coordination between the private sector and the government for longer term infrastructure planning.

- Planning approaches must be transparent and strengthened to provide certainty in protecting industrial areas, buffers and corridors.

- Development of electricity sector assets should continue to be industry led, driven by commercial arrangements and supported by efficient approvals processes.

- Water reform must provide certainty over water access and enable market mechanisms where water scarcity may occur, allocating water for highest value use.

For a copy of the full 2015-2025 Western Australian Resources Sector Outlook please visit the CME website www.cmewa.com or scan the QR code below.

CME thanks the following member companies for providing the photographs which appear in this publication: Alcoa of Australia, BHP Billiton, Dampier Bunbury Natural Gas Pipeline, Fortescue Metals Group, Northern Minerals, Rio Tinto, Sinosteel Midwest Corporation, Woodside Energy.
Contact

The Chamber of Minerals and Energy of Western Australia
Andrew Winter
Manager – Infrastructure
a.winter@cmewa.com

Deloitte Access Economics
Matt Judkins
Partner
mjudkins@deloitte.com.au