What trends and/or developments may affect the current and future supply and demand of the skills and workforce for Mining and LNG

(Please provide comment on whether the trends and/or developments relate to the whole of or its sub-industries)

Commodity Prices

Western Australian mining is exploring and expanding at the same time. This has been coupled with high commodity prices boosting production targets and export sales. 2020-21 was a year of capital expansion projects. With only access to limited labour pool in WA, this combination of expansion in exploration, expansion in construction and production has created a difficult combination of conditions. However, despite these conditions and a global pandemic, the mining sector in WA in 2020 – 21 delivered a record $210 billion in 2020-21 in sales which is up from $174 billion in 2020. The result was driven almost entirely by the iron ore industry, which recorded sales valued of $155 billion.[1].

Commodity Prices

The mining sector's success was driven principally by three commodities: Iron Ore, Gold, and Nickel. Iron ore's contribution to was by far the most valuable mined commodity in WA.

The iron ore market is highly concentrated, with China accounting for around three quarters of global imports. Australia accounts for around 58% of global seaborne exports and Brazil usually accounts for a further 25%, although this has been slightly lower following Vale's Brumadinho tailings dam disaster. This market concentration contributes to a highly volatile price as demand is highly dependent on economic conditions and policies in China. The stimulatory policies in China in response to the pandemic have particularly influenced the iron ore price. For example, in mid-May 2021, the iron ore price reached a record $US235.6 per tonne, around $US140 to $US150 per tonne above prices prior to the outbreak of the pandemic[2].

Iron ore prices declined in August 2021. This was because of the assumption that Chinese steel production would be lower than expected to meet 2030 emissions targets.[3]. Over the longer term, Chinese demand for industrial commodities is expected to moderate as it continues to transition to a consumer-based economy and seeks to contain greenhouse gas emissions[4].

Predictions are that iron ore price will not surpass US$200 a tonne as it did in its peak. However, iron ore prices are predicted remain above $US100 per tonne into 2023. There are suggestions that prices will decline below $100/t from 2025[5]. Lower iron ore prices in 2022 are predicted to be offset by stronger copper prices. If ammonia and hydrogen are executed in the future, their export is also predicted to offset the price volatility of iron ore for select producers such as FMG[6].

Gold prices were also a very strong during 2021-22.

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[1] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx#:~:text=Western%20Australia%20and%20its%20resources,%24177%20billion%20set%20in%202020

[2] WA Budget p. 54

[3] Financial Review Iron ore's price pain is coking coal's gain 06/09/2021

[4] WA Budget p. 25

[5] https://www.australianmining.com.au/news/iron-ore-outlook-looking-stronger-by-the-day-fitch/

[6] https://www.australianmining.com.au/news/iron-ore-outlook-looking-stronger-by-the-day-fitch/

The net effect of buoyant prices across commodities and with future hydrogen industries coming online is that the requirements for labour in the resources sector will not diminish in the short to medium term.

DMIRS Major Commodity Resources data 2021[9]

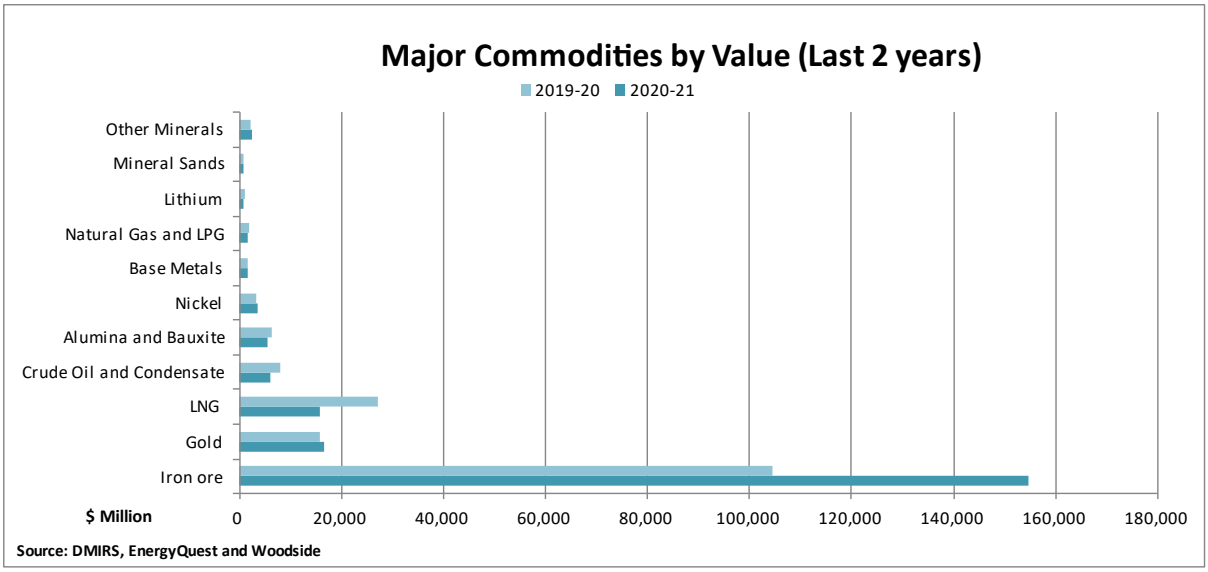
In March 2022, the gold market climbed to its highest level since August 2020 in response to Russian's invasion of Ukraine and investors sought a safe haven for assets. Additionally, gold generally rises in price when there are interest rate rises. Rate rise cycles are predicted to occur in 2022[7]. Gold prices are predicted to remain buoyant in 2022.

Lithium, nickel, copper, and rare earth prices have also been very strong across 2021 and into 2022 with higher than anticipated demand for electric vehicles and as climate change momentum builds. [8]

On the import side, Western Australia's goods imports increased 6.1% in 2021 to $35.5 billion. Machinery and transport equipment accounted for about a third of this total. China was the largest source of Western Australia's goods imports in 2021, followed by the United States and Singapore.

	2019-20		2020-21	
	$ Millions	Share	$ Millions	Share
Iron ore	104,616.53	60.5%	154,732.94	73.8%
Gold	15,872.15	9.2%	16,573.76	7.9%
LNG	27,047.96	15.6%	15,780.50	7.5%
Crude Oil and Condensate	8,082.51	4.7%	5,994.40	2.9%
Alumina and Bauxite	6,416.40	3.7%	5,565.02	2.7%
Nickel	3,167.49	1.8%	3,480.60	1.7%
Base Metals	1,617.55	0.9%	1,716.52	0.8%
Natural Gas and LPG	1,990.31	1.2%	1,698.87	0.8%
Lithium	998.66	0.6%	938.31	0.4%
Mineral Sands	775.30	0.4%	824.45	0.4%
Other Minerals	2,299.08	1.3%	2,339.40	1.1%
Total Minerals	135,763.16	78.5%	186,170.99	88.8%
Total Petroleum	37,120.79	21.5%	23,473.76	11.2%
Total Minerals and Petroleum	172,883.95		209,644.76	

[7] https://capital.com/gold-price-forecast
[8] https://www.afr.com/companies/mining/unprecedented-margins-lithium-prices-defy-forecasters-20220117-p59oup
[9] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx



DMIRS Major Commodity Resources data 2021[10]

Royalty revenue (by commodity, $ millions) 2016 - 2021[11]

Royalty revenue (by commodity, $ millions)[12]	2016-17	2017-18	2018-19	2019-20	2020-21
Bauxite-alumina	81	99	135	114	92
Gold	263	273	291	361	416
Iron Ore	4,620	4,477	4,884	7,803	9,797
Petroleum*	576	685	901	697	389
Nickel, lithium & base metals	109	206	225	210	197
Other**	96	94	117	113	114
Total	5,745	5,835	6,554	9,298	11,005
Petroleum	3	3	12	7	2
North West Shelf Grants	573	682	889	690	386
Nickel	49	57	66	76	84
Lithium		79	83	66	43
Copper, Lead & Zinc	60	71	76	68	71
Other	69	70	87	78	73
Diamonds	13	12	12	11	9
Mineral Sands	14	12	19	23	31

Oil and Gas

The oil and gas industry are a major contributor to the WA economy. During the past two year, the oil and gas industry has seen global disruption due to Covid-19. For Western Australia, there was a downturn in the petroleum industry with the value of LNG (down $11 billion or 41 per cent on 2019-20), condensate (down $1 billion or 21 per cent), and crude oil (down $965 million or 36 per cent) all

[10] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx
[11] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx
[12] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx

declining. This was due to a combination of lower sales quantities and overall weak prices[13].. 2022 has seen world oil markets rebound somewhat from the massive demand shock triggered by Covid-19.

WA currently has five operating LNG export projects: the Northwest Shelf, Pluto, Gorgon, Wheatstone and Prelude. The State's total LNG export capacity is 50 million tonnes a year. Western Australia's LNG projects have low operating costs, giving them the capacity to maintain continuity of supply as prices vary.

Of Western Australia's total LNG exports in 2019: Japan accounted for 50 per cent China accounted for 27 per cent South Korea accounted for 10 per cent Taiwan accounted for 5 per cent Singapore accounted for 3 per cent India and Thailand accounted for 2 per cent each. Others include sales to Thailand, United Arab Emirates, Pakistan and Rest of Australia. In 2019, Chevron (34 per cent), Woodside (17 per cent) and Shell (15 per cent) accounted for the largest shares of Western Australia's LNG production by company[14]

WA's oil and gas industry are taking meaningful action to lower COO2 emissions by implementing effective carbon offset policies, developing new technologies to reduce emissions and improve energy efficiency. Natural gas is a lower emissions form of energy and plays an essential role in reducing greenhouse gas emissions from WA's energy sector, industry, and households. Gas-fired generators are an essential partner to renewable energy generation to provide grid stability, as they can be rapidly started to provide baseload power whenever renewables such as wind and solar are intermittent. Hydrogen will be one technology contributing to decarbonising WA's energy sector and supporting local jobs over the longer term (see below).

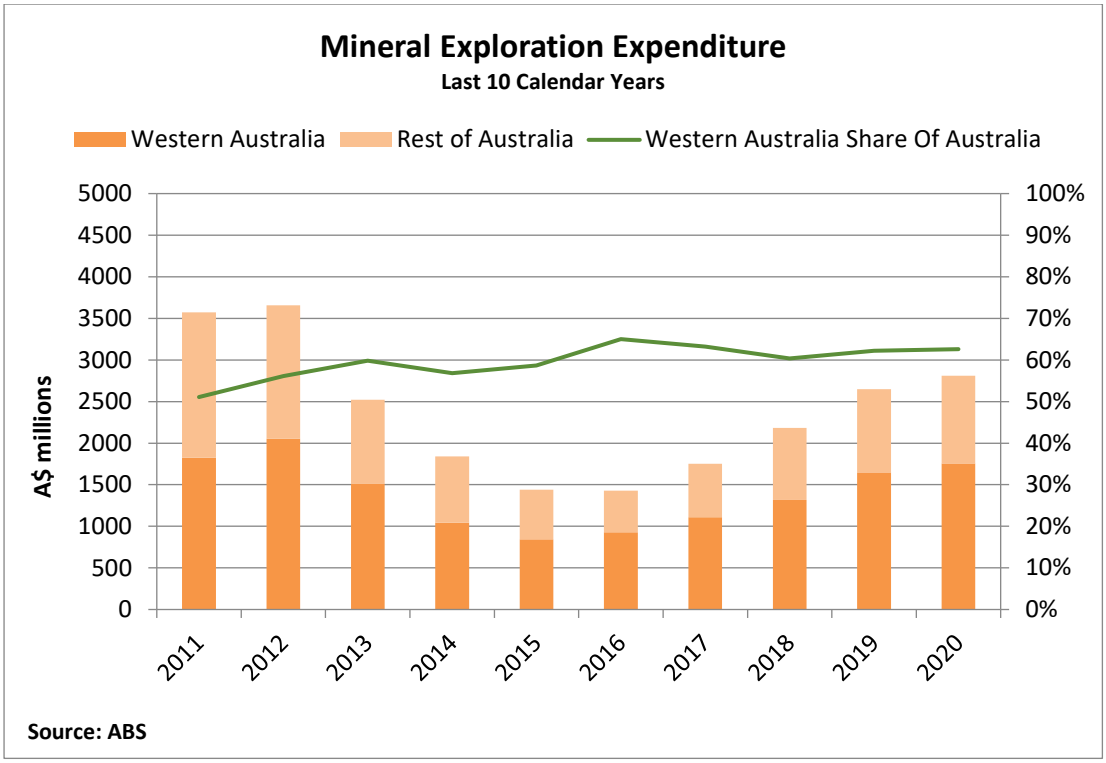
Exploration

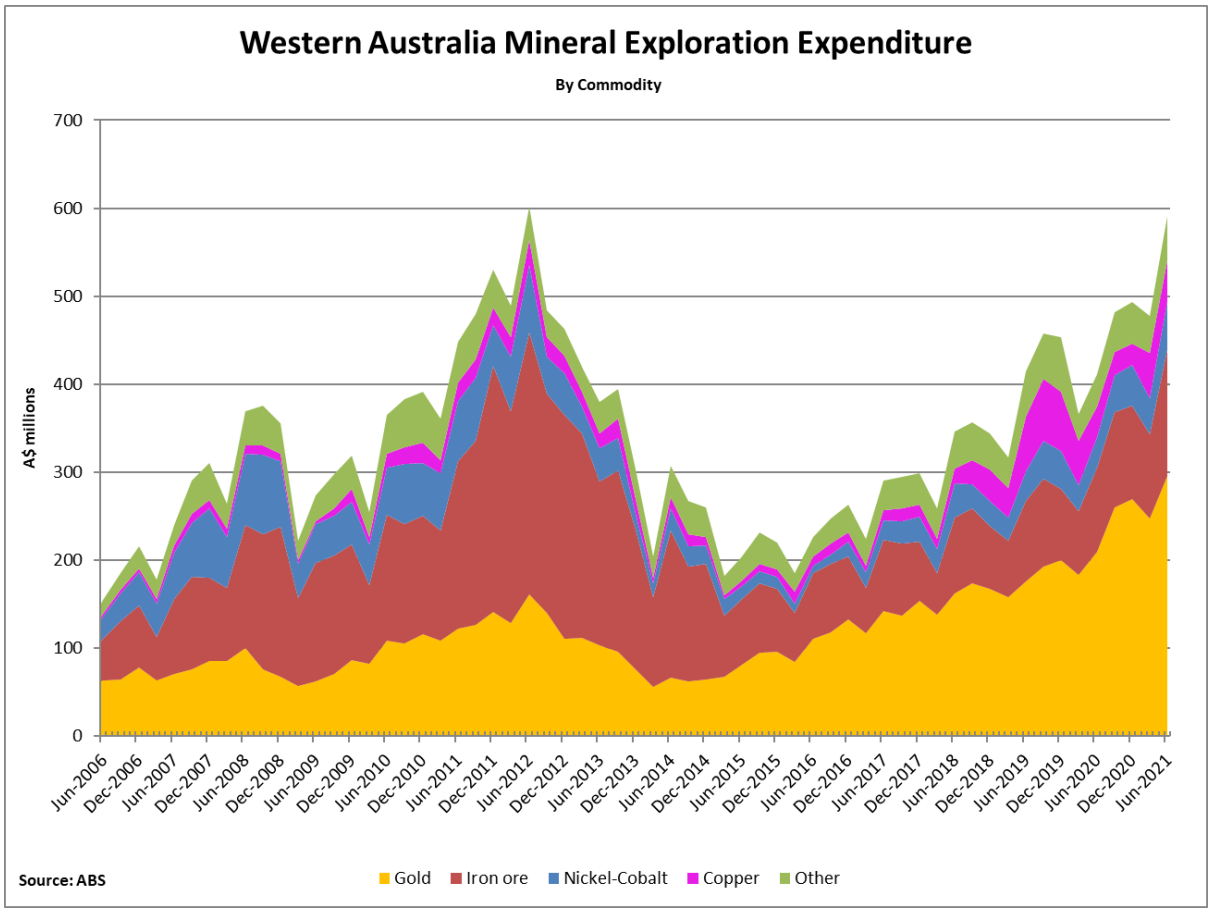
Mineral exploration in Western Australian in 2020 was $1743 million or 62% of Australia's total exploration expenditure. This is up from a ten-year low of $844 million in 2015. This amount represented 59% of Australia's total exploration expenditure[15]. Increased exploration activity is putting pressure on occupations such as Exploration Manager, Geologists, Geophysicists, drillers, and drillers offsiders. All occupations are reporting chronic shortages.

[13] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx#:~:text=Western%20Australia%20and%20its%20resources,%24177%20billion%20set%20in%202020

[14] https://www.jtsi.wa.gov.au/docs/default-source/home-page-publications-display/wa-lng-profile---may-2020.pdf?sfvrsn=a69b711c_2

[15] 2020 Economic Indicators WA Department of Mines, Industry Regulation and Safety

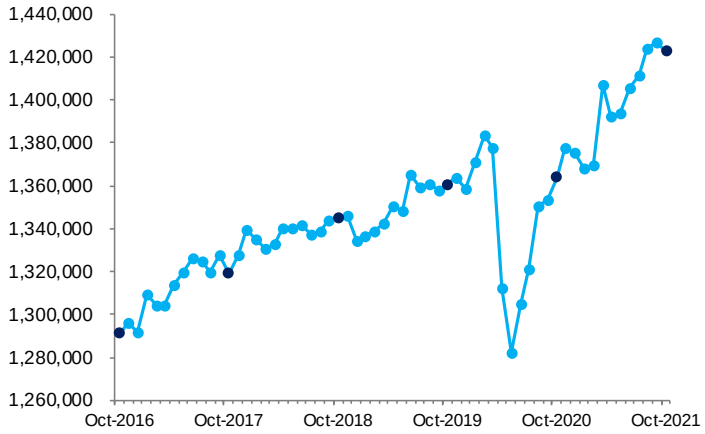




Labour Market

After the initial impact of Covid-19 on the labour market, employment figures in WA have continued to be very buoyant. The WA State Budget 2021-22 forecasts Western Australia's annual average employment will rise 2.5% in 2021-22 and 1.5% in 2022-23[16]

Western Australian Employment by Month[17]



After falling for six consecutive months – and to its lowest rate in almost ten years – Western Australia's unemployment rate rose from 3.4% in December 2021 to 3.7% in January 2022. Western Australia recorded the second lowest unemployment rate of all states and territories in January 2022[18].

The increase in the unemployment rate in January 2022 came despite a 0.6% increase in employment in that month. The higher unemployment rate was driven by an increase in the participation rate, which rose from 69.0% in December 2021 to 69.7% in January 2022, close to the record high of 69.9% in December 2008. Prospects for people entering the labour force remain relatively good, with measures of job vacancies in Western Australia continuing to increase[19]. The female participation rate set a new all-time high in January of 64.6 per cent, against the previous record of 64.2 per cent set in November 2021 [20].

January 2022 workforce data revealed unlike the rest of Australia, there was no spike in WA in the number of people working fewer hours due to illness. Total hours worked in WA also increased by 1.7 per cent, defying the national trend (down 8.8 per cent).

In Stakeholder engagement meetings in February 2022, Industry reported risk management relating to mitigating the potential knock-on effects to productivity relating to any forecast reduction in hours worked and/or rise in absences due to Covid-19 related illness. Stakeholders were engaging mitigation strategies such as working with more recruitment agencies and employing more people on site and in operations to provide additional cover for such an eventuality.

January 2022 average hours worked figures shows that WA has an extremely strong year-on-year performance, with hours worked exceeding January 2021's total by 8.3 per cent. WA's employment growth from January 2021 to 2022 is 6.1%. By contrast, Queensland has experienced 3.8% growth over the past 12 months[21].

[16] JTSI Western Australia economic Profile – November 2021

[17] JTSI Western Australia economic Profile – November 2021

[18] JTSI WA Economic Profile February 2022

[19] JTSI WA Economic Profile February 2022

[20] https://bcec.edu.au/assets/2022/03/Monthly-Labour-Market-Update-January-2022.pdf

[21] https://bcec.edu.au/assets/2022/03/Monthly-Labour-Market-Update-January-2022.pdf

Stakeholders report that across their workforce, employees have had to do more with less to respond to the shortfalls in personnel on site whilst maintaining safety standards. In addition, skilled and experienced workers are spending more time training and supervising new employees with less resources available to meet productive outputs. These resourcing problems persist in office-based roles, with problems reported in retention rates putting a strain on management, in particular HR roles. The unique working conditions and health and safety requirements of the resources sector means that the barriers to entry can often be high for new entrants. Stakeholders report that although they have taken on 'new to mining' and entry level roles in record numbers, this requires the resources on site to be able to mentor, train and supervise new entrants to mining. One Stakeholder reported that 'this has created a buckling upward pressure on the current skilled workforce and supervisors on site.

Although WA's unemployment rate is across the board low, the youth unemployment rate increased by an unusually high 2.4ppt to 10.7 per cent in August 2021. The youth unemployment rate fell again to 8.2 per cent during September 2021. With only a small decrease in the participation rate, this indicates a significant recovery in youth unemployment.[22]

One Stakeholder reported that 'we can only train so many new to mining at once as it puts uphill pressure on people on site … we trained 150 new operators last year.'

Stakeholder all raise concern over the volume of new to mining and the health and safety implications. '…the incidents on site are showing a lack of deeper understanding and a gap in experience.'

There is a need to proactively identify skills gaps horizontally for strategic planning purposes and start to strategically plan to build those skills for industry for now and into the future for a robust economy (see below). This includes new to industry as well as upskilling existing workers in their current roles or transitioning into roles where there are acute shortages.

January 2022, saw increases in demand concentrated in labourers (+11 per cent) and technicians and trade workers (+9 per cent) [23]. Stakeholders also report chronic shortages in key white-collar occupations across engineering roles, earth sciences, metallurgists, underground surveyors, maintenance planners.

Despite the slight increase in unemployment figures, the participation rate in WA is up and this means that the labour market in WA is the tightest it's been in over a decade. The labour force underutilisation rate around is also at the lowest level since 2008[24].

Internet job vacancy data (a measure of labour demand) also fell to 2.2 - the lowest level since 2008. Official data indicates that wage pressures may start to build in 2022[25].

However, a reliance on lag indicators like job ads and vacancy data is unlikely to reflect the current labour market dynamics. Stakeholders have been reporting to the RITC that the labour market has been difficult for over 12 months with it being even more restrictive in the past 6 months of 2021 and into 2022. Stakeholders have also reported for the past 18 months that across many roles, wage and salary increases have been occurring to attract and retain employees (see below).

Stakeholders have reported elevated base salaries in past 12 month of over 10% for graduates and increases of over 13% for Professionals. This excludes the additional incentives that employers are

[22] https://bcec.edu.au/assets/2021/10/Monthly-Labour-Market-Update-September-2021-1.pdf
[23] https://bcec.edu.au/assets/2022/03/Monthly-Labour-Market-Update-January-2022.pdf
[24] https://bcec.edu.au/assets/2022/03/Monthly-Labour-Market-Update-January-2022
[25] https://www.watc.wa.gov.au/wp-content/uploads/2021/08/Labour-force-January-2022.pdf

having to attract and retain workers (see below). Trades have seen varying degrees of wage inflation with some now reporting reaching an absolute peak and plateauing as companies now turn to international skilled recruitment to solve their acute workforce shortages (for example auto electrician and heavy diesel fitter).

Competition for labour

The Western Australian resource industry faces competition for labour internally with competition between construction projects, operations, and shutdown work. There is also competition for labour with other jurisdictions. Engagement with stakeholders suggests that official labour market data may not be giving a true reflection of just how tight current labour market conditions are. Stakeholders refer to the fact that they are all 'fishing from the same pool' and that 'poaching' is the norm with employers using a variety of incentives to attract staff (see below). Based on a combination of projects currently under construction, new projects reaching final investment decision and a consistent demand for shutdown and maintenance workers, the requirement for workforce across exploration, mining, construction, infrastructure and shutdown and maintenance is staggering. Low unemployment rates in Western Australia are also a very strong indicator that the labour market is effectively 'tapped out'.

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Stakeholders report that in the last six months of 2021 and into 2022, the labour market in WA in exploration, operations, construction, and shutdowns has become extremely tight. Retention issues are being widely reported across stakeholder engagement meetings.

On some sites stakeholders, have reported turnover to be anywhere from 20% to as high as 50% of the workforce and in corporate offices 20%.

An example of what stakeholders have been reporting:

'In 2019 we had 12% turn over. In 2021, we recruited 306 positions for a workforce of 800. Our site turnover is at 26% and corporate office is 20%.'

One stakeholder commented that in 2020 they were hiring 120 people a week and had 500 vacancies. In 2022, whilst maintaining the previous year's hiring ambition they are only able to hire 50 a week due to unmet demand and vacancies have grown to over 700 – they lose 36 people a week.

One white collar recruitment company that specialises in recruitment for the resources sector reported: 'We currently have 485 jobs on our books and 142 jobs that we have been unable to send CVs for - that is nearly 30% of positions that we are unable to provide a CV to our clients for. …..Clients are coming to us as they have been unable to fill the position themselves.'

Stakeholders commonly report several things that indicate a very tight labour market:

- Clients (mining companies) poaching from contracting companies due to insufficient skilled and experienced workers on the market. The brand recognition of client can be more attractive.
- Clients offering more flexible roasters and paying the same and more
- The talent pipeline for new entrants is shrinking – some industries reporting it is difficult to attract entry level positions (see below)
- Prior to March 2022, the state borders were more onerous to navigate in 2021 than in 2020 with more difficulty accessing workers from other states due to border restrictions.

- More hesitancy being reported about relocating to WA permanently because of perceived border insecurity
- Younger applicants are seeing dollar signs but not career opportunities, and they are jumping for labouring jobs such as Trades Assistant and haul truck jobs rather than taking traineeships and apprenticeship pathways

Stakeholders have also expressed concerns over:

- Overall reduction in graduate applications. This was being particularly felt by the oil and gas sector
- Downturn in safety and productivity with workers who are qualified but less experienced or skilled and with the increase in volume of new entrants to mining. Introducing new under-experienced and under-supervised entrants into high-risk work environments presents both immediate safety risks. The Brady Review of all mine site fatalities in Queensland from 2000 to 2019 highlighted the dire consequences of inadequate training and supervision[26].
- Difficulty in attracting workers to WA with housing pressures and previous quarantine requirements, competing with a higher pipeline of infrastructure work interstate.

In a recent survey by CCIWA, 81 per cent of mining businesses said suitable candidates were declining offers because they were being proposed higher salaries elsewhere. CCIWA stated that only a quarter of WA businesses (28 per cent) expect to be able to fill all the critical gaps in their workforce from Australian workers. "Our economy is more reliant on overseas migration to cover shortfalls in our workforce, and we have no option but to find a way to access skilled migrants[27]."

As stated previously, the number one issue for the Resources sector in WA is related to labour shortages and capacity constraints, with anecdotal evidence of some businesses' output being constrained by an inability to obtain appropriate labour. The concern is that is the issue becomes more widespread, it could impact investment in the near term.[28]

There continues to be ongoing shortage across professional roles, trades, maintenance, operators and maritime workers with increasing competition between and within industry sectors (for the same finite pool), with cases of wage pressure on the rise and repeat of recruitment referrals.

[29]

Mining and Petroleum Employment by Calendar Year

Commodity	2015	2016	2017	2018	2019	2020
Alumina - Bauxite	7,597	6,719	6,689	7,049	7,384	9,921
Base Metals	2,499	2,234	2,415	2,530	2,849	2,340
Coal	1,035	1,108	1,108	1,174	1,239	1,101
Construction Materials	1,450	1,977	2,622	2,656	2,732	2,614
Diamonds	1,194	873	817	867	827	360
Gold	21,373	25,488	28,206	30,682	31,590	33,155

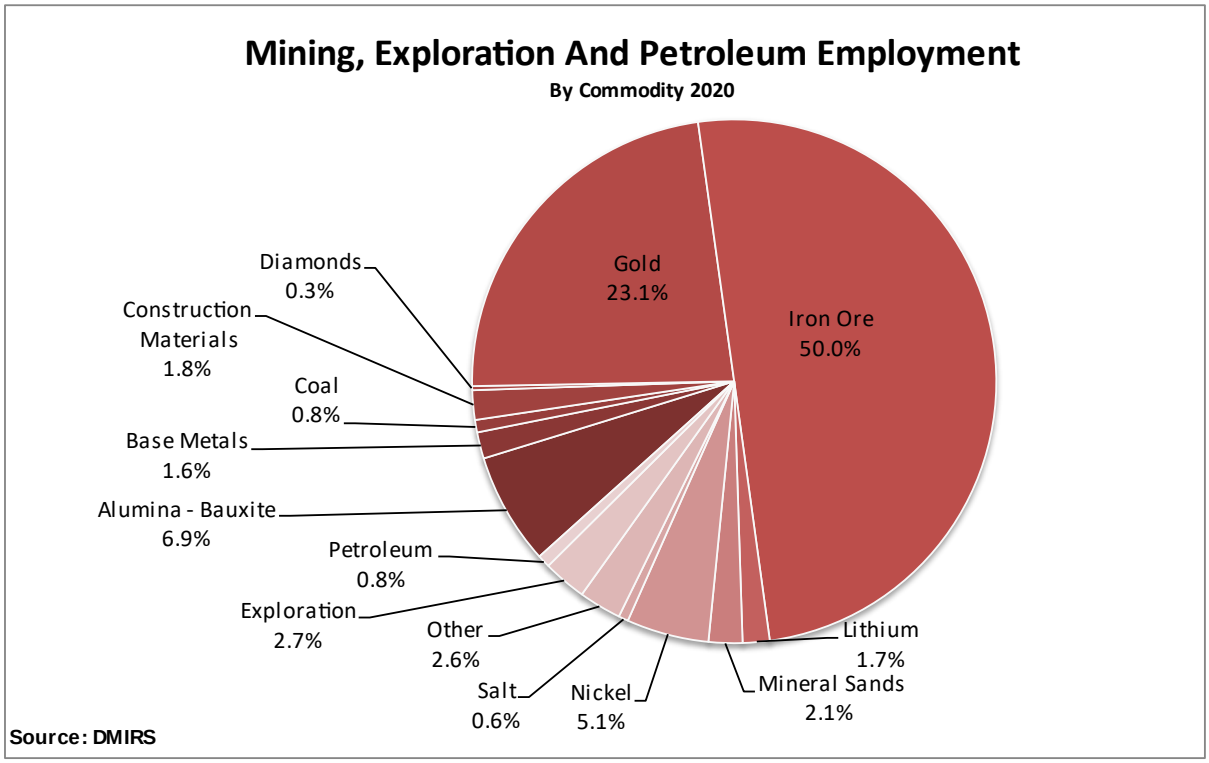
[26] https://documents.parliament.qld.gov.au/tableOffice/TabledPapers/2020/5620T197.pdf

[27] West Australian Resources industry devours itself in job wars: CCIWA survey 23/07/2021

[28] Budget p. 22

[29] https://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx

Iron Ore	54,948	52,306	53,283	56,350	64,618	71,857
Lithium	668	865	1,569	3,137	3,566	2,386
Mineral Sands	2,301	2,397	2,277	2,773	3,086	2,991
Nickel	6,042	5,452	5,928	5,575	6,924	7,294
Salt	909	835	892	1,022	1,078	864
Other	3,015	2,642	3,553	3,827	3,749	3,763
Exploration	2,255	2,143	2,433	2,868	3,450	3,848
Petroleum	1,737	1,101	1,270	1,293	1,429	1,124
Total Mining and Exploration	105,286	105,039	111,792	120,511	133,094	142,493
Total Mining, Exploration and Petroleum	107,022	106,140	113,062	121,804	134,523	143,617



Projects in WA

As of March 2021, there were $140 billion worth of resources sector projects in the development pipeline[30]. Notable in 2021 was BHP South Flanks mine in the Pilbara achieved first ore production. This is WA's largest new iron ore mine for 50 years.

At the end of 2021, the top 20 biggest projects underway in WA were worth more than $50 billion. The top major projects not under way but considered likely to proceed were worth $25 billion. In October

[30] https://www.cmewa.com.au/media-release/jobs-record-highlights-mining-and-resources-sectors-pivotal-role-in-wa/

2021, Deloitte forecast $110 billion worth of projects in the planning stage in WA[31]. The five biggest projects underway as of January 2022 were in oil and gas, worth a combined $32 billion.

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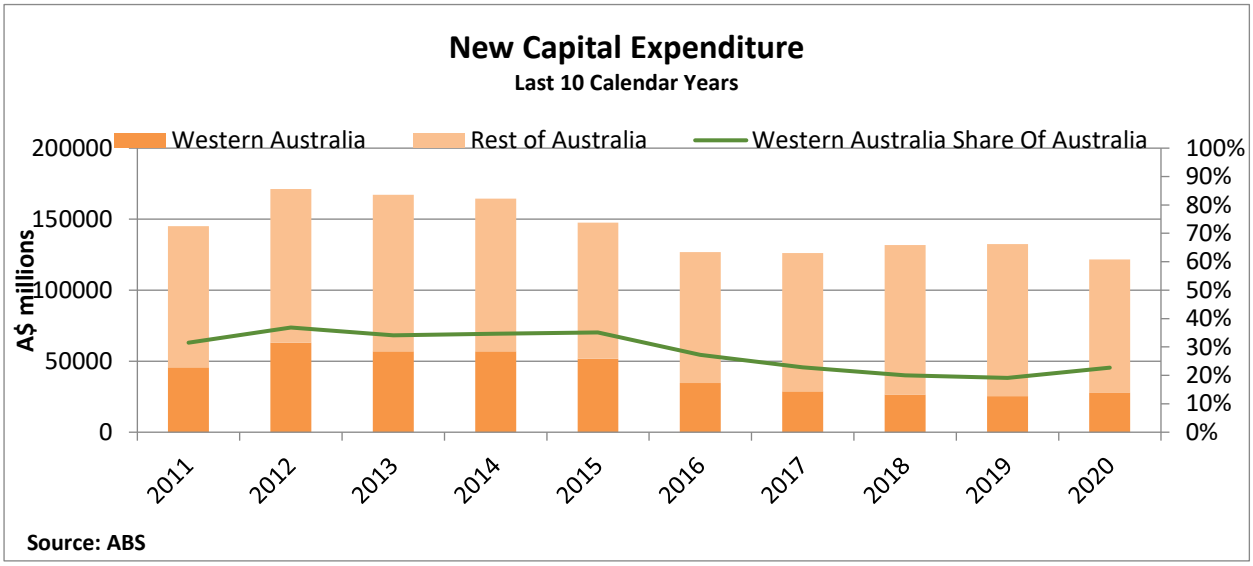

WA Major Project Pipeline[32]

Ongoing	Who	How Much
Scarborough LNG	Woodside	$8.8bn
Pluto Train 2	Woodside	$7.6bn
Jansz/lo (Gorgon) compression	Chevron	$6bn
Gorgon State 2	Chevron	$5bn
Barossa Gas	Santos	$4.7bn
Iron Bridge	Fortescue Metals Group	$3.8bn
Gudai-Darri	Rio Tinto	$3.5bn
Offshore Patrol Vessels	Dpt Defence	$2.8bn
Forrestfield Airport Link	Public Transport Authority of WA	$1.9bn
Mt Holland	Covalent Lithium	$1.9bn
Kemerton Lithium Plant	Albemarle Corporation	$1.6bn
Metronet – Future Rail Cars	Alstom	$1.2bn
Mardie salt and potash project	BCI Minerals	$1.2bn
Morley Ellenbrook line	Public Transport Authority of WA	$1.1bn
Bunbury Outer Ring Road	Main Roads WA	$825m
Waitsia Stage 2	Mitsui & Co	$750m
Thornlie-Cockburn Link	Public Transport Authority of WA	$716m
Avertas Energy	Macquarie Capital	$600m
Julimar/Brunello stage 2- Wheatstone	Woodside	$600m
Yanchep Rail Extension	Public Transport Authority of WA	$520m
Likely	**Who**	**How Much**
Burrup Urea Plant	Perdaman	$4.6bn
Westport	Department of Transport	$4bn
Square Kilometre Array	Department of Transport	$3bn
Ashburton Hub Iron Ore	Mineral Resources	$2.5bn
Dorado	Santos	$2.2bn

[31] Business News Major projects pipelines faces blockages January 17, 2022
[32] Business News Major projects pipelines faces blockages January 17, 2022

Crux	Shell	$2bn
Cockburn Quarter	Perron Group	$1bn
Perth Girls School	ADC_Warburton Group	$1bn
Mallina	De Grey Mining	$893m
Tonkin Highway Stage 3	Main Roads WA	$505m
Kalgoorlie Rare Earths Processing Facility	Lynas Rare Earth	$500m
Byford Rail Extension	Public Transport Authority of WA	$481m
Kathleen Valley	Liontown Resources	$470m
Inner Armadale Line Level Crossing Removal	Public Transport Authority of WA	$$415m
Lot 5&6 Elizabeth Quay	Brookfield	$367m
Tonkin Highway Interchange	Main Roads WA	$$366m
Ashburton Salt	K+S Group	$350m
West Erregulla Stage 1	Strike Energy	$300m
Eramurra Solar Salt	Leichhardt	$280m
Great Norther Highway Bindoon Bypass	Main Roads WA	$275m

Infrastructure Projects in Other States

Western Australia is competing for skills and labour across public infrastructure on projects in other states. In October 2021, it was estimated that 182, 000 individuals were engaged in the delivery of public infrastructure projects across Australia including engineers, trades, and labourers. 79% of this workforce was engaged in New South Wales, Victoria, or Queensland. Of the 50 occupations that are identified with being relevant to public infrastructure, 34 are rated as either likely or potentially in short supply. Over the next three years, demand for skills and labour on infrastructure jobs is predicted to peak at a likely shortfall of 93,000 workers in early 2023 or 48% higher than projected supply[33].

This projected shortfall will include 70, 000 engineers, scientists, and architects, 16,000 structural and civil trades and 14, 000 finishing trades. There is also an added risk posed by an aging workforce with 40% of the current workforce predicted to retire in the next 15 years. The current infrastructure boom across Australia is predicted to extend until 2025. It is predicted that at least one in three advertised jobs will go unfilled on public infrastructure projects. The likely impact being project delays and cost overruns[34].

Business NSW reported the difficulty in filling positions in the following occupations: Electricians, Carpenters; Automotive mechanics; and Fitters and turners.[35]

Some 60 per cent of businesses in NSW reported that filling experienced positions was harder than filling entry-level ones. Business NSW provided the following reasons:

- 51 per cent reported that shortages were due to applicants not having the right skills, capabilities, qualifications, or experience
- 33 per cent attributed their skills shortages to the JobSeeker rate being too high
- 29 per cent reported that applicant's wage demands were too high.[36]

[33] Infrastructure Australia Infrastructure Workforce and skills supply October 2021

34 Infrastructure Australia Infrastructure Workforce and skills supply October 2021

[35] https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Migration/SkilledMigrationProgram/Report/section?id=committees%2freportjnt%2f024650%2f76060

[36] Infrastructure Australia Infrastructure Workforce and skills supply October 2021

Western Australia has traditionally relied upon the Eastern States as a source of recruitment for employees to either relocate to Western Australia for work or to FIFO into WA for work.
Overlapping occupations engaged in infrastructure work in the Eastern States that that are in competition with the resources sector in Western Australia are for example: Civil Engineers, electrical engineers, environmental professionals, geologists, geophysicist, and hydrologists, geotechnical engineers, drillers, maintenance planners, production engineers, structural engineers, mechanical engineers, crane operators, rail track workers, civil plant operators, electricians, general construction labourers[37].

In the previous capital expenditure boom experienced by WA prior to 2013, WA was not in competition with projects on the eastern seaboard and wages in WA were very attractive as an incentive to either relocate or to FIFO into WA. This meant major construction projects such as Wheatstone and Gorgon, mining expansion projects and major shut down work benefited from recruitment from other states and from 457 visa holders. However, since 2013 the incentive to relocate has changed due to attractive wages on offer. It has been reported that renumeration in other states is now comparable to what an employee can earn in WA so there is no real incentive to FIFO and have disruptions to family life. Covid has shifted people's priorities and to examine their work/ life balance and to opt to return home every day to their family rather than to commute to another state for work. A hesitancy to navigating WA's borders has also been reported.

Borders

Since April 5, 2020, WA has been closed to much of the rest of the nation and to international skilled migration after hard border restrictions came into force because of COVID-19. WA finally reopened its borders in March 2022 after nearly two years to largescale international arrivals and with borders closed to other Australian jurisdictions[38]. One of the most notable impacts felt by the West Australian resources sector due to COVID-19 was workforce and mobility constraints.

Interstate workers had previously come from all jurisdictions in Australia, with Queensland the largest source state. New South Wales and Victoria had similar levels of interstate workers in WA. Queensland is viewed as a 'mining state' with a similar workforce to WA including professional occupations (mine mangers, engineers, earth sciences, trades and semi-skilled and unskilled workers). Stakeholder consultation also revealed that Queensland also provided a large percentage of WA's oil and gas workers – predominantly Cert III level production workers.

Closed borders with other states made FIFO into WA almost impossible. During the period that WA had closed borders to other states, some employees made the decision to work longer rosters and stay in WA during their rest and relaxation (R&R) period. Many employers supported employees through this transition and continue to offer a range of attractive incentives for employees to relocate permanently to WA, including paying relocation, temporary accommodation and other related expenses.

Stakeholders report that relocation of employees was assisted by offering a range of incentives for interstate workers willing to make the move to WA – including relocation costs, assistance to relocate families, employer-provided housing, rent and/or mortgage assistance, vehicle allowances and personal travel incentives. Many companies also paid for quarantine accommodation and salaries during the quarantine period, and in some instances established their own dedicated quarantine facilities for their staff.

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[37] Infrastructure Australia Infrastructure Workforce and skills supply October 2021

[38] Western Australia enters 'new era' of COVID-19 pandemic as border reopens after almost 700 days Chanel Nine News 3 March 2022 https://www.9news.com.au/national/coronavirus-wa-updates-western-australia-hard-border-comes-down-state-reopens/a63aea54-2a9b-49cc-ad9e-5e143b2e3adc

CME surveyed their member companies in 2021 and based on survey responses, CME estimates at least 2,500 interstate employees relocated temporarily or permanently to WA during the survey collection [39]

Industry consultation revealed a majority of companies have implemented new or strengthened existing WA-first hiring policy for new jobs at their operations around the State, and this is expected to continue with WA being the point of hire.

Interstate Migration[40]

	March 2020 Quarter			December 2020 Quarter			March 2021 Quarter		
	Arrivals	Departures	Net	Arrivals	Departures	Net	Arrival	Departures	Net
WA	7033	7257	-224	8947	7742	1205	9161	7522	1639

Official ABS interstate migration data shows:

- There was a net gain of 1,600 people from internal migration in the March 2021 quarter, compared with a gain of 1,200 people in the previous quarter and a net loss of 220 people in the March 2020 quarter.
- The net gain in the March 2021 quarter was the largest net gain since the June 2012 quarter (+2,400).
- Interstate arrivals increased from 8,900 in the previous quarter to 9,200 in the March 2021 quarter, while departures decreased from 7,700 to 7,500.
- March 2021 quarter arrivals were at their highest for a quarter since the December 2013 quarter, and departures were at their lowest since September 2020.
- In net terms, Western Australia gained the most people from New South Wales (+570).

Due to COVID-19 and WA's hard border, many interstate FIFO workers temporarily relocated to WA, to be able to continue working in the WA industry. For some this means a long and extended time away from seeing family in their home states.

Workers from other jurisdiction are an important source of labour for WA's resource sector, where highly skilled positions require many years of experience. These cannot be satisfied immediately from a pool of recent graduates, where many years of experience and experience in different contexts and across different machinery and equipment is required to be considered competent and skilled. This is equally true and important in the maritime and transport industries.

Many businesses in the resources sector operate over a national footprint with operating sites in more than one state (and indeed internationally). A highly skilled and mobile workforce is required to service their operations. The ability to move people across borders is an important business model and necessary to ensure productivity.

Barriers to Moving to WA

There are valid reasons why individuals and their families may not want to make the move permanently to Western Australia. Reasons that have been given by stakeholders include lack of extended family and support networks, lack of available childcare in the regions, moving away from personal networks, complex child custody arrangements, the perceived risk of border closures and ability to travel back to

[39] https://www.cmewa.com.au/wp-content/uploads/2021/03/210319-CME-EY-Navigating-COVID-Report-v1.0.pdf

[40] https://www.abs.gov.au/statistics/people/population/regional-internal-migration-estimates-provisional/latest-release

visit family, and the perceived isolation of Perth from the rest of Australia. Given the sharpened focus on mental health and wellbeing that has come with COVID-19, these circumstances should also be taken into consideration.

Stakeholders have reported that employees who did FIFO into WA and who have now settled into work in their home state have got used to going home to their families every night and the work/ life balance that this brings. Stakeholders also report that the wage gap between other states and WA has closed so there is no longer an incentive to FIFO into WA for attractive wages or salaries. Many stakeholders reported that they had employees lined up to relocate to WA when borders where to pen on the 5th of February. When this situation changed, stakeholders reported losing these candidates to the local job market. Previous hard borders and insecurities about being not able to travel home to visit family act as a major deterrent. A consistent theme of people staying on the east coast with more reluctance to relocate is emerging in many industry consultations.

Western Australia has also heavily relied upon skilled migration to attract workers. The Australian Bureau of Statistics (ABS), in their latest release titled 'Overseas Arrivals and Departures, Australia' demonstrated that short-term arrivals in Australia over 2020-21 were down 80.7 per cent on the previous year (2019-2020), with 7.6 million fewer arrivals[41].

The Report states: The impact of the pandemic can be seen through decreases sustained across various permanent skilled migration categories in the 2019-20 program outcome which delivered 140,366 places, a 12.4 per cent decrease of 29.082 places allocated to permanent skilled migration in the 2020-21 migration program level. The decrease in temporary migration is greater with a 26.5 per cent decrease (-2.34 million) in the number of temporary visa grants in the same period with visas (tourist and visitor visa grants) making up the majority of this loss.[42]

Lack of international migration has impacted engineering roles across the board, geologists/ geophysicists, all trades and the requirements of industry for semi-skilled and unskilled workers. The lack of international students has impacted engineering enrolments in particular. The following tables show how overseas students have grown as a proportion of university enrolment numbers in the past 15 years. In 2020 -2022 when international borders were closed, this had a large impact on the Australian University sector and the number of overseas students who were able to enrol and gain access to Australian education programs. Overseas student by 2012, almost made up 43.6% of the engineering enrolments in Australian universities.

Award Course Completions for All Students by Citizenship and Broad Field of Education, 2004 to 2019:
Engineering and Related Technologies

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Domestic Students															
8,175	7,578	8,001	7,941	8,164	8,367	8,935	9,424	9,896	10,461	11,074	11,545	11,501	11,403	11,915	11,277
Overseas Students															
4,575	5,215	4,873	5,053	5,701	5,833	6,655	7,405	7,016	7,825	8,476	8,544	9,896	11,360	13,445	14,593

41 https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Migration/SkilledMigrationProgram/Report/section?id=committees%2freportjnt%2f024650%2f76060

42 https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Migration/SkilledMigrationProgram/Report/section?id=committees%2freportjnt%2f024650%2f76060

Award Course Completions for All Students by State, Higher Education Institutions in Western Australia and Citizenship, 2019

Western Australia	Domestic	Overseas	Total
Curtin University	6,119	3,632	9,751
Edith Cowan University	3,896	1,851	5,747
Murdoch University	2,366	2,285	4,651
The University of Notre Dame Australia	2,251	21	2,272
The University of Western Australia	5,062	1,765	6,827
Non-University Higher Education Institutions	327	1,529	1,856

Globally, other countries are reporting labour shortages. Canada for example lists 15 top in demand jobs. Four out of the 15 jobs are in the resources sector – welder, engineer, electrician and mechanical engineer[43]. The UK is also reporting falling unemployment rates in 2022 and high vacancies rates across most sectors including construction. [44] UK Shortage Occupation List includes from the resources industry: geologists/ geophysicists, civil engineers, mechanical engineers, electronics and electrical engineers, production and process engineers, and welding trades[45].

New Zealand has a long list of long-term occupational shortages and regional requirements including engineers, drafts people, metal fabricators, welders, fitters, truck drivers, automotive electricians, HD fitter and electrician[46].

The global skills and/or labour demand speaks to an on-going need for Australia and Western Australia to remain internationally competitive in securing skilled migrant talent. Especially for securing talent considered the 'best of the best', and for on-shoring experts in globally strategic industries like Hydrogen and Critical Minerals. Existing migration policies and future efficiencies should be considered with this context in mind.

Covid mandate and reopening

Under the mandatory vaccination laws for the WA resources industry, anyone visiting a mine site after December 1 2020 had to have one jab, while two jabs were required after January 1 2022.

Stakeholders reported that the mandatory vaccination for workers in mining involved an administrative pressure on HR departments to follow up and ensure all employees were vaccinated and could provide proof of vaccination. Contractors also indicated that there was an additional administrative burden to provide evidence of vaccination to companies that they contracted to. Stakeholders reported that there were a small handful of individuals who did not reach vaccination status. They tended to be older and experienced workers and in some occupations their exit from industry left a dent – for example jumbo operators in underground mines.

Stakeholders report that:

[43] https://www.immigration.ca/canada-labour-shortage-these-are-the-top-15-most-in-demand-jobs-for-2022
[44] https://www.theguardian.com/business/2022/feb/12/its-not-quite-the-black-death-but-worker-shortage-hits-uk-firms-hard
[45] https://www.davidsonmorris.com/shortage-occupation-list/
[46] https://skillshortages.immigration.govt.nz/

- health directives and vaccination mandates have been a core focus of business operations, in the lead up to December 2021 with educative approaches to vaccination rates having been undertaken.
- Chamber of Commerce and Industry estimate WA economy workforce resignation at and lower due to vaccination mandates. Expectation the resources sector will be lower resignation rates compared to some other industries.

Early in 2022 industry reported risk managing for borders open and preparing robust controls such as increased screening, isolation, contact tracing and a risk-based approach from government to managing cases on site but not shut down.

Responding to COVID-19 also created and increased demand for workers and increased load on management. Jobs in public administration and safety have increased by a remarkable 25.9 per cent[47]. In early 2021 occupations like safety adviser were not being reported by industry to be in demand. By early 2022, the reverse was being reported that demand for safety advisors was outstripping supply as this occupation was increasingly important to implementing Covid risk mitigation strategies on site.

Trade Impact and Maritime Workers

Mining and LNG are export commodities that rely on shipping. This has been affected by global impact on international shipping crews and on critical restrictions on the mobility of domestic maritime workers, such as marine pilots. Crew changeouts of international maritime workers remains heavily restricted worldwide due to COVID-19 risk factors, despite collective efforts to improve controls. Domestic maritime workers are drawn from a small pool, and like some of the highly specialised roles across the resources sector, rely on unique skillsets and many years of accredited experience – meaning there is no short-term pathway fix. A shortage or short term 'shock' of labour availability in either area could have substantial impact on trade – and in turn revenue – flows out of the resources export industry.

Supply Chain Impact

Across 2021 and into 2022 supply chain issues were reported by stakeholders. During the pandemic shipping prices have soared with rising demand for non-bulk good such as food, couches, electronics, and other goods collided with shutdowns at factories and ports, leading to a shortage of space on ocean vessels as countries competed to get products from foreign shores to their own.

For example, The New York Times recently reported that the price to transport a container from China to the West Coast of the United States costs 12 times as much as it did two years ago, while the time it takes a container to make that journey has nearly doubled. That has pushed up costs for companies that source products or parts from overseas, seeping into what consumers pay. The conflict in Ukraine is expected to cause further disruptions [48].

The Transport sector has faced supply chain disruptions in various forms since the onset of the pandemic. Most significantly, sporadic port closures and surges in consumer demand for goods have contributed to global sea freight bottle necks, particularly in the movement of goods between Asia and North America. However, these bottle necks have increased sea freight costs by as much as ten times pre-pandemic levels and caused significant delays in the international movement of goods. These factors have had mixed effects on operators in the Transport sector. On one hand, transport operators are able to charge higher prices due to surging demand and limited capacity, particularly for sea freight

[47] https://bcec.edu.au/assets/2021/10/Monthly-Labour-Market-Update-September-2021-1.pdf
[48] New York Times, With Inflation Surging, Biden Targets Ocean Shipping 21 March 2022

transport. However, customer satisfaction has deteriorated as businesses and end consumers have endured longer wait times for certain goods.

Stakeholders in the resources sector in WA report higher freight costs and having to purchase 60 days in advance to ensure continuity in supply. Many stakeholders across industry sectors report having to stockpile supplies.

For industry that is involved in exporting shipping issues have been reported out of Fremantle. 'Shipping don't want to stop in Perth port due to hard border and union issues - container availability and cost to overseas becomes increasing. Too hard to get product out of Fremantle port.'

Stakeholder report supply chain raised in industry consultation to include:

- Spare parts are increasingly more difficult to source and more expensive
- AdBlue (the additive used for two stroke engines) is in very short supply. A global AdBlue shortage, which helps limit pollution from diesel engines, is afflicting transport around the world. Australia gets most of its AdBlue from China, who have widely restricted its distribution. Australia has five weeks supply of the product. The short supply is adding to the cost of supplies by almost 6 times the price[49].
- Hino Trucks can be up to 6-month lead time to order and 4WD vehicles can be over 20 months lead time.

The current outbreak of the Omicron variant in Australia has presented new issues for the sector. The surge in infections has created staff shortages, which have been further exacerbated by close contact isolation requirements in late 2021 and into early 2022. The severity of these shortages varies across the sector. For example, firms have indicated anywhere from 10% to 50% of truck drivers are not available for work due to returning a positive test or isolation requirements. The Transport Workers' Union has reported that a third to half of Australia's truck drivers were not working during the second week of January. Many road freight transport operators had already reported boosting wages to attract more staff, which will likely continue as these shortages persist during the Omicron wave.

Staff shortages are contributing to an increase in congestion at container terminals. Ports in Melbourne and Sydney are experiencing the most significant delays. These delays are anticipated to eventually lead consumers to put off certain purchases, slightly reducing the volume of goods requiring transport and, as a result, limiting revenue in the short term. However, higher prices could offset this pressure on revenue. While sea freight container prices have recorded the most significant increase, congestion at ports and limitations on road freight space could also lead to greater competition and rising prices. Depending on the duration of these conditions, road freight and broader logistics firms could benefit from higher prices across more modes of transport. However, the Federal Government has relaxed isolation and testing requirements for staff in critical sectors, including transport, which is likely to provide some relief from staff shortages and the associated freight congestion. Despite all these disruptions and difficulties, transport operators are expected to record higher profits as larger downstream customers that rely on timely distribution vie for container space through intense price competition [50].

[49] 'Critical' trucking crisis could see shop prices rise, fleets shut down Channel 9 news 19 December 2021 ttps://www.9news.com.au/national/trucking-crisis-adblue-diesel-additive-shortage-could-put-prices-high/9ec2e6d4-f6a1-4a7a-9cb9-8450d991ebca

[50] https://www.ibisworld.com/blog/supply-chain-and-labour-challanges/61/1133/

In transport and logistics stakeholders are also reporting a shortage in HV/oversize escorts from Main Roads which are impacting mining and delaying movement of machinery and large equipment movement to site. As a labour pool consisting of casual based work with stop-start continuity it is not competitive in this labour market to fill the roles.

Examples of what industry have reported in terms of supply chain issues:

- One stakeholder reported that it is taking 20 months to order a Landcruiser and 8 months to geta Toyota Hilux. Delays in car fleet orders are due to cuts in production in Toyota factories and delays caused by chip shortages. Resurgence in COVID-19 cases in Japan, Philippines, Thailand, Vietnam and Malaysia — home to auto factories and chip plants — have compounded the crisis. Toyota had flagged an unpredictable business environment due to fresh COVID-19 cases in emerging economies, the semiconductor shortage and soaring material prices. WA mining is heavily reliant on 4WD fleets and these disruptions in Asian car manufacturers are being felt in the sector.
- Stakeholders are reporting spot prices for containerised freight that are two to three times higher. With controls to manage the Delta and Omicron variant and strong demand for consumer goods and prolonged processing times at Asian ports is creating congestion, bottlenecks and leading to shipping delays along the entire container shipping chain. The OECD expects this trend to persist, with significant additional shipping capacity only likely to appear in 2023[51].
- Shifting consumer patterns during the pandemic have also taken suppliers by surprise and have resulted in transportation issues becoming a major driver of supply chain issues since around mid-2020. This primarily reflects a global shortage of shipping containers, particularly out of China, and a mismatch of the location of containers, which are often full in one direction but empty in the other direction. At various times this has been exacerbated by congestion at some ports around the world as increased import volumes have coincided with reduced capacity due to restrictions. The lack of shipping containers has resulted in sharp increases in global shipping prices since mid-2020 as well as delivery delays[52]
- Supply chain issues have resulted in higher costs for PPE and cleaning products, and container and air freight costs have also increased significantly[53].

Technology

The resources sector is investing heavily in technology such as data, connectivity and telecommunications, and automation. The sector technology is utilised to achieve sustainability, growth and productivity goals. Going forward for the sector, sustainability is an important business priority.

Technological advancements are helping to drive safety and compliance in the sector for example the introduction of automated and technology-enabled mine sites has helped reduce or remove some of the traditional risks of mining, protecting the health and wellbeing of employees, and increasing productivity and efficiency.

[51] Reserve Bank of Australia Statement on Monetary Policy – May 2021Box B: Supply Chains During the COVID-19 Pandemic
[52] Reserve Bank of Australia Statement on Monetary Policy – May 2021Box B: Supply Chains During the COVID-19 Pandemic
[53] Reserve Bank of Australia Statement on Monetary Policy – May 2021Box B: Supply Chains During the COVID-19 Pandemic

Minerals Council of Australia commissioned EY to do a skills map for the future in 2018–19. In that report, 77% of jobs in the Australian mining industry will either be enhanced or redesigned due to technology over a five-year period[54].

The three technology areas that miners are investing in the most are data analytics, digital connectivity, and integrated automation[55].

Stakeholders report that finding the right people with the right skills, along with retention and a training system that is keeping up with the technological changes, are the biggest challenges. Cultural changes area also required within companies to embrace technology - without taking your people on the digital journey, implementing new technology successfully can be a challenge.

Some examples of technology that has been harnessed in mining:

Automated vehicles – such as haul trucks on surface mining operations and 'boggers' in underground mines. Automated vehicles require new and modified jobs centred around advanced technologies that require modern skill sets. For example, autonomous vehicles require off-site oversight or central control and supervision, while still needing new skill sets for on-site mechanical and maintenance skills for regular preventative maintenance. Stakeholders report that the introduction of remote operations centres has increased diversity in the industry and lead to a change in the thinking around how non-mining people can add value to the mining industry.

Automated drilling rigs that are operated remotely using detailed telemetry and multi-camera vision – impacted drill and blast crews.

Robotics - Auto Control Systems robotic applications are used in assembly, packing, machine tending, inspecting, welding, capping and labelling just to name a few. Industry reports more people with servicing and maintenance skills sets are required to service and maintain robotic equipment particularly in a minerals laboratory setting.

Predicative and preventative maintenance - continuous monitoring via asset telematics and IoT sensors and devices, you can detect problems (such as excessive vibrations or temperature increases) and accurately forecast time to failure - as well as guide you to the correct fix. Building a data bank and machine learning algorithms enables better schedule maintenance and implement predictive maintenance regimes. Requires higher levels telemetry, diagnostics, OEM sensor devices for maintenance and servicing trades.

'Smart bolts' - Rock bolts are used to stabilize mining tunnels by distributing stress evenly and are pivotal in reducing the risk of cave-ins in underground mines. Yet until now there has been no way of assessing the health of rock bolts. Smart bolts contain sensors that detect stress changes and vibrations, and produce huge levels of data on its condition, signalling when maintenance is needed, and warning of future failures. They are also extremely energy efficient and will run for years on a single non-rechargeable battery cell.

Sustainability and Climate Change

The resources sector is increasingly responding to the risk that climate change poses and is strategically working to reduce emissions by focussing on technical innovations to improve environmental outcomes and decarbonise.

[54] /wp_equinix_mining_technology_report_2021_en.pdf
[55] wp_equinix_mining_technology_report_2021

Renewable Energies

The resources industry is moving towards harnessing innovations to utilise renewable forms of energy. For example, the installation of Australia's largest hybrid renewable microgrid at Gold Field's Agnew gold mine in May 2020. The 56-megawatt microgrid incorporates five wind turbines, 10, 710 panel solar farm, battery system and off grid gas/ diesel engine power plant which delivers 70 percent of the mines power requirements[56].

Whilst the pathway to grid modernisation is still under development (particularly for the Southwest Interconnected System), the drive for renewable sources of energy means there must be a workforce capable of installing solar panel farms and wind turbines, and a workforce who is able to maintain them. The use of new gas turbines that works with a microgrid means that there is a requirement for an operator/ maintainer role that understands how renewable power sources work within a grid. This is largely an automated grid. However, a trade background maintainer/ operator role that can maintain and monitor the automated panel and grid supply is required. This role is currently being sources from other states; however, the development of a traineeship pathway needs to be investigated further and may be beneficial.

Hydrogen vehicles are being invested in to reduce cardon emissions. In August 2020, FMG announced $32 million investment in hydrogen buses and a renewable hydrogen production and refuelling facility to replace diesel buses at Christmas Creek[57].

WA has developed a Renewable Hydrogen Strategy with ambition to become a significant producer, exporter and user of renewable hydrogen.

Battery electric vehicles are another innovation that is being adopted by the resource sector to cut overall $C0_2$ emissions and mitigate the risks of diesel-powered vehicles on the health and wellbeing of employees – diesel-particulate inhalation. Battery electric vehicles (BEV) are electric vehicles that use exclusively chemical energy stored in rechargeable battery packs, with no secondary source of propulsion. BEV are being considered more for underground mine usage. Companies such as Epiroc, MacLean Engineering, Normet, and Sandvik now offer a range of different BEVs designed explicitly for underground operations[58].

BEVs can also save on the high costs on ventilation and cooling in underground operations and improve noise levels. On average, the switch to a fully electric mobile fleet results in a 40% to 50% reduction in ventilation demands. This is equivalent to considerable cost savings in both power used and ventilation infrastructure. Other benefits include maintenance costs, with battery vehicles having 25% or fewer parts less than diesel propulsion systems [59].

Stakeholders report that BEVs impact the role of auto electricians directly now and will ultimately impact the role of diesel fitters on site as the industry replaces their diesel fleet with other forms of powered vehicles over the medium to long term. The challenge is for the training sector to keep up with an industry sector that is in a state of technological change. Underground mining, like surface mining is adopting automated vehicles. The technology used is different in an underground facility as fibre optic cables are used rather than GPS technology. Again, this technological adoption is directly

[56] A World Leading Resources Sector: *Western Australia's mineral and petroleum resources development strategy*. Government of Western Australia 2021
[57] A World Leading Resources Sector: *Western Australia's mineral and petroleum resources development strategy*. Government of Western Australia 2021
[58] https://www.mining-technology.com/features/battery-electric-vehicles-facilitating-low-carbon-mines/
[59] https://www.mining-technology.com/features/battery-electric-vehicles-facilitating-low-carbon-mines/

affecting auto electricians as they must adapt to data coms, connectivity, networking and basic programming.

LNG – Carbon capture and sequester

Carbon Capture and Storage (CCS) is an integrated suite of technologies than can capture CO_2 and transport to a selected storage site, rather than it being released into the atmosphere. The selected storage site is commonly a deep, rock formation where CO_2 can be injected and permanently stored.[60]
In March 2022, the WA State Government announced that it will draft the Greenhouse Gas Storage and Transport Bill. This Bill is seen by industry as a positive development as it will provide regulatory certainty in this area to reduce emissions and contribute to a cleaner energy future[61].
CCS has great value for the oil & gas industries due to its role in sequestering CO_2 released during operations, and helping the global economy work towards net-zero carbon emissions. The Gorgon CCS project in Western Australia is currently Australia's only working CCS project. The Gorgon CCS system started up safely in August 2019. However, in mid-2021 Chevron reported the CCS project had failed to reach the 80% CO_2 capture target from their Gorgon LNG project. Chevron has said it fell short of the target by 5.23Mt and will buy the equivalent amount in carbon credits while also investing $40m in unspecified "low carbon energy projects" in the state. Chevron said it had missed the 80% target because of technical problems that delayed the CO_2 injection into geological formations under Barrow Island. Based on prices for carbon offsets in mid-Nov 2021, Chevron would have to pay between $78m and $194m[62].
As of 2018, there were 43 large-scale CCS facilities globally - 18 in commercial operation, five under construction and 20 in various stages of development. To meet the climate mitigation targets outlined in the Paris Agreement, an estimated 2,000-plus large-scale CCS facilities must be deployed by globally 2050[2]
Higher education institutions are looking at the skills required for CCS technology and the impact on the study of geology and geophysics.

Please identify the regions for those trends and/or developments. Select all that apply?

Perth Metropolitan Area

CME membership companies report in 2019-20 that there are 40, 905 jobs in the metropolitan and a contribution of $6.18 billion in wages and salaries[63]. A total direct contribution of $37.5 billion went to supporting wages, business purchases, community contributions and local government payments[64].
Perth resources industry is dominated by the industrial strip in Kwinana which is growing and will be the location of Woodside's Hydrogen Hub. The hydrogen facility will be built on 130 hectares of industrial land commercially leased from the WA government at the Kwinana and Rockingham Strategic Industrial Areas. The phased development will see the facility initially produce 300 tonnes of hydrogen per day and eventually scale up to produce 1500tpd. The hydrogen would be produced for both local demand as well as in the form of ammonia and liquid hydrogen for export and will use a combination of electrolysis and methane reforming to produce the hydrogen, with 100% of the emissions offset [65].
Kwinana is also looking at the future of a new container port and Outer Harbour that will be at the centre of Perth's freight network – Westport.
Covalent Lithium has entered a long-term lease for a 40-hectare site in the Kwinana Strategic Industrial Area (SIA) where it will commence construction of a lithium refinery.

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[60] https://www.globalccsinstitute.com/wp-content/uploads/2018/12/Global-CCS-Institute-Fact-Sheet_What-is-CCS.pdf
[61] https://www.appea.com.au/all_news/media-release-wa-legislation-will-encourage-decarbonisation-and-cleaner-energy/
[62] https://www.theguardian.com/australia-news/2021/nov/12/australias-only-working-carbon-capture-and-storage-project-fails-to-meet-target
[63] https://www.cmewa.com.au/wp-content/uploads/2021/07/Perth-metropolitan.pdf
[64] https://www.cmewa.com.au/wp-content/uploads/2021/07/Perth-metropolitan.pdf
[65] https://www.energynewsbulletin.net/hydrogen/news/1420143/woodside-to-build-ausd1b-hydrogen-production-hub-in-kwinana

Henderson also represents a large cluster of resource-based companies providing services to defence, mining and oil and gas such as Matrix and Civmec. Supply chain companies to the resources industry are also located in areas such as Forrestfield, Welshpool, South Guilford Wangara and Malaga.
Metropolitan Perth has also undergone a period of expanded residential and commercial construction as well as government infrastructure projects that have either commenced or will be commencing.
Housing is reported to be constrained in Perth for people wanting to relocate for work.
The tight labour market means there is competition for labour across many sectors in the metropolitan area including freight, logistics, defence, infrastructure, and residential and commercial construction.
Federal bosting apprenticeship schemes have seen apprentices enrolled in metropolitan TAFEs in record numbers. Industry reports the need to attract new entrants and to also rapidly recognise competency for employees who have experience but not the qualifications to accompany the experience. New to supervisory and leadership positions require upskilling and support with how to step into their new positions of responsibility and industry report there are not enough operationally fit for purpose training courses. Industry would also like to diversity with the resources sector, currently at 85% male employees. NSW government has introduced a scheme 'Built for Women' free fee scheme to attract 3000 training places for women into construction and related trades[66]. This could be something that WA could look at implementing to build diversity in trades.
Stakeholders report it can be difficult to attract younger cohorts (school leavers and university graduates from the metropolitan area) to industry and to entry level positions. The reasons often cited are:

- Demanding shifts of 12 hours that may include nights/ weekend and holidays
- Requirements to travel long distances to work
- Remote locations of work and connectivity on site is different to metro jobs
- Reputation for unhealthy work cultures
- Negative perception of industry in terms of environmental impact
- Gender balance – 85% of the workforce is male

In a recent report published by the RITC, the value of pre apprenticeships was confirmed. Pre-apprenticeships are offered by most schools with Trade Training Centres and VET in Schools programs. Pre-apprenticeships are universally highly valued by both industry and schools with benefits including providing base skills, supporting work readiness, and acting as screening tools for aptitude and interest in trade pathways. Specifically, when asked questions relating to post-school candidate employability, completion of a pre-apprenticeship program was highly regarded by industry. Pre-apprenticeship programs are highly popular within the student cohort and participation in these courses can be highly competitive. School student demand for the most popular courses (e.g., Certificate II in Electrotechnology Career Start) often outstrips the places available[67].

Goldfields-Esperance

CME members in 2019-20 contributed 2902 full time jobs to the region and $328 million in wages [68] In the region of Goldfields-Esperance, total direct contributions of $1.25 billion went to wages, business purchases, community contributions and local government payment [69].
The Goldfields-Esperance region itself is the largest in WA, covering some 771,276sqkm; just under a third of the State's total land mass. Made up of nine local government areas, mining accounted for 56.6 per cent of the more than$9.3 billion 2014/15 economic output for all industries in the region. And unlike other mining hubs across Australia, a large percentage of the Goldfields mining workforce resided in the area[70].
The area is synonymous with gold mining but also has an abundance of nickel reserves across several local government areas as well as rare earth projects. On the lithium front, there were several mines

[66] https://education.nsw.gov.au/skills-nsw/built-for-women
[67] RITC VET In Schools And Pathways For School-Leavers Into The Resources Sector - Discussion Paper
[68] https://www.cmewa.com.au/wp-content/uploads/2021/07/Goldfields-Esperance.pdf
[69] https://www.cmewa.com.au/wp-content/uploads/2021/07/Goldfields-Esperance.pdf
[70] https://australianminingreview.com.au/features/mining-in-the-goldfields-full-of-life/

recently completed or under construction that added new opportunities such as Lithium Gold Mines Australia at the Mt Kirk Project. (Lithium, tantalum, rubidium and tin)[71].

Alongside labour and skills shortages, one of the single most important issues for the area that has been reported for a long time has been availability of housing. There has been an accommodation crisis for some. This had put enormous pressure on any business trying to relocate staff to the region.

Stakeholders report attracting people to the region to live, and work is difficult given the acute shortage of housing. In stakeholder meetings companies reported that it is often easier to attract someone for the eastern states to WA than it is to get a local to move from Perth to the Goldfields as they attract them on the history and unique work opportunity offered by the goldfields and the lifestyle opportunities. Stakeholders report that if attracting a couple or family it is often important to consider employment opportunities for the other partner as part of relocation to make the decision easier. Consideration has to be given to school and childcare arrangements.

However, at the same time stakeholders report that some employees from other states who did settle in the goldfields on a longer temporary basis due to border restrictions were returning to their home state as of November 2021 onwards.

There have been reports of season issues related to crime in the area and mining companies have funded summer programs, services, and outreach programs to mitigate the problem.

Childcare also remains an issue for the region.

Smaller companies in the region are finding it increasingly difficult to attract and retain employees.

Stakeholders report a close and responsive connection between Curtin School of Mines and CR TAFE.

Midwest/Gascoyne

In the Midwest and Gascoyne, CME member companies in 2019-20 report total direct contributions of $403.9 million went to supporting 1178 full time jobs, $151 million in wages and salaries and $252.4 million in local government payments[72].

Mining is its most valuable sector for the region, with a range of minerals and energy deposits available including gold, iron ore, copper, nickel, silver and natural gas. Demand for the region's resources has driven a rise in employment, triggering a number of new mining and construction projects and job growth in associated service sectors.

Technicians and trade workers account for the highest percentage of occupations in the region.

Pilbara

In the Pilbara, CME member companies report in the region of Pilbara, total direct contributions of $1.79 billion went to supporting 5989 local jobs, $930 million in wages and salaries and $861.3 million in local government payments.

Shortage of labour and access to people with the right skills and experience has been widely reported across the Pilbara by stakeholders. Issues that make attracting and retaining people into the Pilbara have been reported by industry as follows:

- Access to childcare,
- Liveability issues associated with living in the region – availability and cost of housing, cost of insurances
- Availability of medical facilities
- Availability of local training solutions particularly for some in need trades and some issues with quality of training have been reported

One of the very biggest issues facing the Pilbara region (and Kimberly region) is crime. More broadly, crime has escalated in the Northwest over the past twelve months. Statistics for burglaries and stealing of motor vehicles are alarming on the increase. Local governments have implemented crime reduction

[71] https://www.lithiumgoldmine.com/projects/mt-kirk-lithium-and-gold-project-western-australia/

[72] https://www.cmewa.com.au/wp-content/uploads/2021/07/Mid-West-Gascoyne.pdf

strategies including increased youth services. There are long-standing systemic and social issues driving youth to disengage and participate in crime[73]

South West

The South West CME members total direct contributions of $1.76 billion went to supporting 6113 full time jobs, $817 million in wages and salaries, and $938.6 million in local government payments[74].
Stakeholders in the Southwest all mention that their workforce is an aging workforce with the average age of workers commonly being over 40 and the average age of service being around 14 years. There is currently a feeling that the region is competing with the Pilbara and Goldfields for FIFO work as flights operate out of Busselton for major mining companies and now some contracting service providers.
Stakeholders report;

- Seek is not working as a recruitment tool
- Like other regions the scheduling of shutdowns has become a major problem as shut down contracting companies are feeling the pressure of labour shortages
- There is an agreement that the labour market is tapped out
- Workforce that is coming up to retirement age tended to put off retirement during the 2019-early 2022 period as people were not able to travel
- Other projects in the region or new sustainability projects in Perth have attracted staff and back filling is needed.
- The volume of applicants is down, and the experience level of applicants is also down.
- Stakeholders report losing experienced people and having to replace with much less experienced people.
- The housing market in Bunbury and Busselton is extremely tight which makes attracting employees into the region very difficult.
- Industry in the area very keen to develop linkages and pathways with local high schools and with SR TAFE

What training strategies has industry used, or may consider using in the future to respond to these trends and/or developments?

Industry and School links

Across the resources industry there is a genuine interest in establishing connections with local school to promote careers into the resources sector and build early pipelines into trades and professions. Industry currently does this in an ad hoc way and the Year 9 Taster Program and PD for School Career Advisers may be a more strategic way of creating awareness of the sector and career pathways. For example, Roy Hill have developed a high school engagement strategy; Yarra have employees teaching science classes at local Karratha high schools and other companies have Senior Professionals return to their high schools to give talks about their careers and time in industry.
Kwinana Industry Council imen and iwomen program run a very successful school and industry linkage program for 26 high schools to connect with industries in Kwinana and Fremantle.

VET in Schools

School-based Traineeship programs of relevance to the resources sector are seen as a successful pathway towards an apprenticeship and career in the resources sector. Program delivery is dependent on the partnership between the school, training provider and employer.
There are some barriers:
Student age - Primarily this precludes mine site access for students in a work capacity (under 16 years), and most companies will not allow persons under the age of 18 years on site, unless they are employed in an apprentice / trainee arrangement. Any student site orientation programs which have been

[73] CME Pilbara Regional Council Meeting Agenda Notes March 2022.
[74] https://www.cmewa.com.au/wp-content/uploads/2021/07/South-West.pdf

completed by companies (FMG and Thiess hosted a small group local school students in a work readiness program) are usually under a visitor rather than an employment / training relationship.
Businesses with workshop capacity have reported success in hosting work placement students for short durations (like pre-apprenticeships and work experience) and will often house new apprentices in a foundational learning program for 6-12 months. This workshop environment (commonly metro-based) enables these businesses to safely recruit and skill apprentices of younger ages in a well-controlled environment, provided candidates meet other selection criteria. Importantly, whilst successfully hosting school-aged learners, businesses note other limitations such as supervision needs.

Location of industry and schools - One of the key factors for VET in Schools program success is the composition and density of the immediate locality, as work placement students are often (not always) from the local catchment. In metropolitan areas, students have greater transportation access and school choice (dependent on home environment), which enables the local industry to draw from a greater pool of candidates. Regional areas are however limited by the size of their local school community and industry, and the impact of this fixed pool of industry and students varies. For instance, Yara Pilbara Fertilizers report entry to their regional school-based pilot VET program was highly competitive amongst school students and the organisation lacked the available places to cater for demand, whereas stakeholders in Kalgoorlie have noted access to students in VET programs can be competitive amongst industry due to the small number of schools in the township.

Some remote operators in the resources sector do not have any schools within an acceptable range for the hosting of work placements students without also providing accommodation. Whilst this is possible, the barriers surrounding age and purpose of visit remain, alongside ensuring pastoral care for young people living away from home. The Girls in Mining camp run by Curtin University and previous FMG work readiness program, are positive examples of bringing youth onto site, however this is in a careers / workplace awareness context as visitors rather than workplace learning.

Supervision - Another universal barrier reported by industry is operating lean and a lack of available staff to adequately supervise school-based learners. Companies which have work placement students report they are at capacity, not only from a number's perspective, but also the suitability of existing workers to act as mentors for young people. Training providers have also reported training workshop places are at or nearing capacity, largely due to the incentivizing (and associated increased uptake) of apprentices with COVID stimulus measures.

Work Readiness - The orientation of a student from a school-based learning environment to a workplace requires the learning and attainment of several soft skills, collectively termed 'work readiness' - maturity, situational awareness, work hardening, safety preparedness, cultural alignment, resilience, and finance management are common traits attributed to work readiness. Additionally, an ability to communicate in an industry setting (with colleagues of varying ages, cultural backgrounds, and seniority) and life skills (success setting and asking questions) are reported. This skills base is complex and often formed with years of experience in a workplace, which is difficult for a young person to achieve. Consequently, industry have broadly reported a work readiness gap between the Certificate II and Certificate III qualifications.

Site readiness - Site readiness is an extension of work readiness and is critically important to ensure worker safety on site and is unlikely to be achieved in a school-based learner. Site readiness encompasses the transition from a standard working environment to operating on a resources sector site. Within this definition workers needs to adapt to hardened working conditions including, following strict procedures, long working hours (successive 12-hour shifts), night shift, living away from home, working in isolation from other team members, hot and dusty conditions, working in remote environments with restricted digital connectivity, taking charge of your physical health (e.g., nutrition, hydration, injury management, drug and alcohol awareness), mental health awareness and individual alignment with business culture and values. To support new workers some companies with the capacity will offer a site transition plan. This transition plan may include assigning shorter rosters for the first few swings, having day shift only for a limited time, and providing 'wrap-around' site support such as designated mentors.

Mentoring resources - Industry collectively reports a toolkit of mentoring resources which support their workforce to better understand, effectively communicate with, and train school-based learners is required. Companies heavily invested in this space have been developing their own resources, however demand remains for a mentoring toolkit for supervisors of school-based learners in heavy industries.

Cost -VET in Schools is accessible under two funding models, a 'fee for service' arrangement with the local TAFE or private RTO, or 'under profile' which is subsidized by the State Government. Demand is outstripping supply for funded places. One TAFE College estimates 50% of applicants are successful in securing a funded place in the most popular programs, and these are heavily subscribed (e.g., pre-apprenticeships). Due to the competitive nature of funded VET in Schools places, many courses (and in some cases all courses from partner RTOs), are completed in a fee for service arrangement. The costs of these programs can be substantial, particularly for trade occupations related relevant to the resources sector. For instance, in the most recent Bunbury Regional Trade Training Centre course catalogue[75] the Certificate II in Engineering Pathways course cost is $2300, the Certificate II in Automotive Electrical Technology $3250, and the Certificate II in Electrotechnology (career start) is $3900. Comparably, a Certificate III in Education Support is costed at $1070, Certificate IV in Preparation for Health and Nursing is $2400, and the Certificate II in Building and Construction (Pathway – Trades) which includes pre-apprenticeships in Brick and Block Laying, Carpentry and Joinery, and Painting and Decorating, are offered at no cost, with places fully funded through the Construction Training Fund (funding subsidies)

Try a Trade

Try a Trade program offers a taster for students at Year 10 to explore the world of work and enables students to choose a VET in school pathway for Year 11 and 12. The decision to expand Try a Trade by CTF to engineering trades such as mechanical fitter, boiler maker and welder is seen as an important step in creating awareness about these roles and career pathways into the resources sector.

Unskilled pathways – new to resources

There are several unskilled pathways to enter the resources sector for example, dump truck, sample prep, drillers offsider, utilities worker which require no qualifications but do have the same work ready and site ready barriers to employment that are outlined above for VET in school. They can be used as a steppingstone through contractor employment to mining companies and contractors to the oil and gas sector. Stakeholders report taking on new to the sector in greater numbers than previously over the past 18 months. However, the requirements for mentoring and supervision for new to industry employees places an uphill burden on existing workers and supervision as there is only so much capacity to train new entrants to industry. As outlined previously, there is also a health and safety concern about the volume of new to mining being on site with no previous experience. New to resources pathways are often used by resource companies to build diversity in their business and many companies report proactively recruiting women into resource jobs, older cohorts, people from Covid displaced industries and aboriginal employees through entry level pathways.

Increasing apprenticeships

Across the board the resources sector has increased the volume and number of trainees and apprenticeships. This number has increased since approximately 2019 onwards. This has been greatly assisted by government incentives. The issue stakeholders report with increasing apprenticeship and traineeship number is the supervisory requirements on site, retention rates and completion rate for younger apprentices can be in the lower range and it is a long pathway to solve an immediate labour and skill issue with an apprenticeship taking over four years to complete. In some regional areas, stakeholders report sending apprentices to Perth to compete training as there is no locally available training solution. This has not been ideal, particularly for more diverse cohorts and in times when there have been lockdown situations leaving apprentices stranded in hotels in Perth. Stakeholders are reporting that qualifications require updating to keep up with technological changes in the workplace.

Adult apprenticeships

[75] https://www.maneasc.wa.edu.au/wp-content/uploads/2021/06/BRTTC-2022-Prospectus.pdf

Increasingly stakeholders reporting either having taken on or wanting to take on adult apprentices. Candidates who are over 21 tend to have higher completion rates than younger cohorts. For contracting companies who have a less certain pipeline of work, a faster track adult apprenticeship is seen as an attractive solution. Stakeholders report the major barrier for adopting adult apprenticeships is the is the time it takes to have an employee assessed through RPL process which remains largely paper based and can often take over 6 months to complete. The time frame of an adult apprenticeship (compared to a qualifications expressed nominal hours) and the funding model for TAFE also exists as a barrier.
Stakeholders utilise trade upgrades to fill labour shortages such as light vehicle to heavy diesel upgrades and run trade upgrade and gap programs for ex-defence personnel.
Unfortunately, RPL processes have become overly concerned with compliance and prescribed inputs and have lost sight of competency as evidence of knowledge and task-based approach relating to experience. A more flexible and agile way of recognising experience and previous learning needs to be found to upskill existing workers, to provide opportunity and access and to utilise current skills toward a streamlined training pathway in a time of labour and skills shortage. Access must exist for new to industry as well as for existing employees to be able to compete trade training to provide the much needed skilled trade labour pool using local WA talent.

VET as an alternate pathway into university

The utilization of VET as an alternate pathway into university is steadily gaining more recognition. In WA partnerships exist between some schools and universities, linking VET in Schools programs to Undergraduate programs and broadening student destinations on graduation. VET has a valuable role to play in skills development and the practical learning pathway is of benefit to students with university aspirations. These programs and partnerships not only provide a credit of university entry and support student choice in tertiary study selection.
This cross-sectoral approach has helped support VET in Schools program enrolments and improve parent perceptions of the value of VET. However, most of these pathways are relatively new. As they become more established, the collation of student destination data into VET or University programs would be useful to further ascertain value and effectiveness.

Upskilling existing workers into skills shortage rolls

Larger business with capacity have started to strategically look at how to upskill workers into critical in need roles, for example how to utilise post graduate training pathways to upskill environmental scientists to hydrogeologists, how to upskill drillers to geologists, process plant operators into metallurgist roles (met tech) , chemical engineers to metallurgist. These upskilling pathways and cross skilling pathways to meet in demand and critical rolls are essential and should be explored further.

What workforce strategies has industry used, or may consider using in the future to respond to these trends and/or developments?

In a time of labour and skills shortages where the resources sector has all been 'fishing from the same pool' industry have had to utilise several different HR strategies to attract and retain a workforce.
The table below shows the shift in responses between 2021 to 2022 in stakeholders surveyed on strategies used to attract and retain employees.

2020-2021	2021-2022
• Traditional ways of recruiting not working – advertising on Seek low levels of response, high international applications	• Seek is broken. We thought Seek was not working any more as we were not getting any applications through. We applied for our own vacancies just to test if Seek still worked • We only advertise 20% of our jobs on Seek as it does not work. 80% of our vacancies we must go to our network to recruit from • We have to advertise on Seek to show we are in the market and looking for candidates, but we do not receive the volume or quality of candidates we would hope for • Stakeholders report spending a lot of money advertising on Seek but having a very low return for spend. • The belief is you have to post jobs on Seek although there is an acknowledgement that it will not gain the return you need as you need to be seen to be advertising/ looking for staff. • Paying for standard advertisements on Seek used to guarantee a hire but this no longer helps. Seek are providing advice with how to attract candidates. • Stakeholder report changing their adds on Seek all the time and trying any tactics to attract people. • Using LinkedIn for blue collar jobs but attracting a lot of overseas applicants. They are not able to get to WA due to visa issues, flights, quarantine etc. • Seek not working, Facebook working. Facebook has been increasingly more useful especially Facebook groups that are tailored. • Tailored and targeted adds on Facebook, paid adds and targeting mining groups. Using their marketing and comms teams to help them in recruitment
• Recruitment from same labour pool – Passive recruitment using LinkedIn, networks, databases (outdated!)	• Using LinkedIn, Networks, Databases • Employing more recruitment companies to assist with recruitment • Advertising on radio with paid advertisements • Advertising on Television with paid advertisements • Extensive use of networks both in WA and in other states • Referrals are part of many companies DNA now. • Relocation packages

	• Advertising on international jobs boards (myjobspace.co.nz) • Advertising on international university graduate jobs boards
• Retention issues	• Retention issues were reported as much worse in the last 6 months of 2021 – early 2022
• Changes to renumeration, packages, rosters, relocation packages	• Offering higher salaries and wages • Offering sign on bonuses • Retention bonus • End of project bonuses • Shares and dividends • Long service bonuses • Referral fees • Private health care • Flexibility on work rosters and working from home for office based • Additional superannuation payments • Rent packages for people relocating and fuel cards • Cash bonuses to move employer • Employees using offers from other companies to leverage pay rises. Feeling that awarding pay rises not based on merit anymore but on retention. • Reticent to raise base salary – 'what you give you can't take away" happy to pay temporary incentives and bonuses as they can be taken back. • Blue collar occupations will move for money and only money • White collar will move for bonuses, flexibility, working at home, culture • Individual headhunting with individual pitch on why to move/ relocate here • FIFO flights paid for into WA (as of March 2022)
• Career advancements more rapid	• Experienced people leaving and having to replace with less experienced • Acceleration of job title without the experience to back up job title • Going to graduates for vacation work and internships earlier in university pipeline (2nd year) • Oil and Gas and Mining in competition for graduates
• Not able to readily access international workers	• Starting to engage Labour Agreements for unskilled workers Not able to readily access international workers • international skilled labour migration for trades in need (auto electrician, heavy diesel fitter, boiler maker) • Feeling that in the last boom the visa system was easier to navigate particularly to bring in unskilled workers.

	• Going to international graduate recruitment sites for geologists (2022) • Going to international jobs boards for jobs like driller and driller offsider (March 2022)
	• Rise in reported 'contracting services' for in demand roles. Experienced employees leaving to set up ABN and hire back to their old employer at higher rate.

Stakeholders are reporting that there are retention and renumeration issues within recruitment occupations. Recruiters are hard to keep hold of, and wage inflation has occurred dramatically with someone with 3-4 years previously earing base salary of $80k and now being offered over $100k - $130k.

Please comment on any future predictions, not supported by evidence, but may have future impact on skills and workforce.

In a time of national skills and labour shortages and with a country emerging from a global pandemic, national VET reform looks to be occurring at an interesting time. What is required is a system with firm foundations to support training and upskilling of a critical workforce as a matter of urgency. There is no question that innovation in qualification development needs to happen to ensure that curriculum is revised and developed in more timely manner, is responsive to the needs of industry, is more focused on occupational tasks and standards and less prescriptive. Qualifications also need to have input from consistent quality industry engagement.

Any other comments and Recommendations

Stakeholders commentary and feedback around current training system:

- Improved capacity to fast-track apprenticeships based on competency is urgently required. Noting, safety must not be compromised in such moves.
- More nimble Recognition of Prior Learning is critically important.
- Revisiting dual apprenticeship structures to support delivery durations better aligned with industry needs is strongly supported.
- Supporting workers to transition in and out of industries and occupations whilst recognising their skills and competencies
- Repurposing of the CTF so it is not just funding construction skills development programs but wider innovative programs that span the resources sector.
- Block release delivery for apprenticeships is supported and improvements to flexible block release scheduling would be advantageous.
- Improving the flexibility of training delivery modes is supported (e.g. online capability).
- Proposal of innovative strategies to support the currency and relevance of trainers and facilities are welcomed.
- Collaboration between the education and training sector and Industry is valued in aid of efficient and effective outcomes. Industry supports a competitive training landscape.
- Collaboration between TAFE and the University sector is valued.
- Innovative and contemporary delivery methods of learning materials and assessments is valued.
- Industry's ability to upskill post trade and support lifelong learning pathways to continuously upskill and re-skill is valued.
- Understand current cohort of learners and adapt the delivery of learning and assessment to incorporate digitally enabled learning and flexibility .
- Repurposing of the CTF so it is not just funding construction skills development programs but wider innovative programs that span the resources sector.

- National Skills Commission to widen the PSMOL to include professions such as Geologist.
- Increasing opportunities for apprenticeships, traineeships, job fairs and job readiness type programs targeting areas of high unemployment, Indigenous and regional populations.
- Improve childcare in regional WA to take advantage of spare capacity (partners of employees) through exploring partnership opportunities with government.
- Holistic approach to access for housing particularly in regional areas.
- Encouraging aging workforce or retired workforce to reskills as trainers and mentors to industry.
- Strategic focus on each individual occupation that is in critical demand to approach multiple pathway options to build and strengthen workforce capacity. Focus on each role and build multiple strategic routes: including developing awareness of the occupation, encouraging pathways in, supporting retention of learners and transition into successful employment, career mentoring once in employment, targeted recruitment from overseas and interstate and upskilling existing workers into roles.
- Training of Supervisors and leading hands, recognising that workforce shortages result in the promotion of technically competent workers who may lack managerial skills. Ensuring that supervisors receive training in 'soft skills' such as people management, delegation, administration, budgeting and reporting will help to mitigate negative productivity impacts across entire teams of workers. Feedback is that current management courses on offer are too white collar in focus and not operational enough – more externally available mentoring and coaching support is required.
- Targeted Interstate and overseas attraction and recruitment Campaigns to attract workers in key occupations and skills groups to Western Australia. This could be a focus on attracting operations workers to relocate to Western Australia on a permanent basis; or establishing attractive FIFO paths for transient workforces undertaking construction, maintenance and shutdowns.
- Targeted Training Programs including 'microcredentials', adult and accelerated apprenticeships for workers with relevant prior experience. This is particularly effective in semi-skilled occupations which lend themselves to short term training and upskilling programs.

The workforce and skills shortage presents both immediate and longer-term problems and the pandemic has highlighted the need for deeper strategic thinking about how we can better align education and skills training with industry needs.