

# JOBS OF THE FUTURE

## SPECIAL REPORT



# Job skills needs shifting from cognitive

**JOBS OF THE FUTURE**

## 1910 in Australia (% of jobs)

Agribusiness  
Manufacturing

Source: ABS

26  
21



## 2020 in WA (% of jobs)

Healthcare & social assistance  
Construction  
Agribusiness  
Manufacturing

Source: Labour Market Information Portal

12.5  
9.2  
2.6  
5.7



## 2019-2024 New WA jobs projected

Industry

Health Care and Social Assistance  
Professional, Scientific and Technical Services  
Education and Training  
Mining  
Accommodation and Food Services

('000)

%

16.0  
11.5  
9.5  
9.3  
8.8

10.3  
10.5  
8.9  
8.8  
9.3

Source: Labour Market Information Portal

An ageing population, environmentalism and automation will be big trends affecting employment in the next decade, with caring and creative jobs advantaged for growth.



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### 4-PAGE FEATURE

**M**ORE than a quarter of the Australian workforce was employed in agribusiness in 1910, with a further 21 per cent working in manufacturing.

Fast forward a century, to August 2020, and just 2.6 per cent of Western Australian jobs were in agricultural industries, federal Labour Market Information Portal data shows, and 5.7 per cent in manufacturing.

Such have been the developments in agricultural practices, however, that a labour force that small is more than enough to feed WA.

About 80 per cent of agribusiness output is exported, according to state government data.

The numbers illustrate a long-term transition in the WA economy, and a trend reflected across the developed world.

New technologies have lifted labour productivity, increased the amount of food or goods produced by a single worker, and enabled a growing share of the workforce to learn new skills and undertake higher-value tasks.

If the story of the 20th century was that rising labour productivity enabled larger segments of the workforce to shift into higher-value jobs, it's far from clear whether that trend will be replicated

in the automation revolution this century.

Growing computing power and data accessibility are supporting the development of machine learning programs, where computers are trained to do tasks otherwise undertaken by humans, such as analysing images or driving cars.

It's widely agreed that repetitive, technical tasks are most at risk of automation, such as driving a truck from inside a mine pit to a processing plant next door.

By contrast, interpersonal and creative skills will be most in demand in Australia in the decade ahead, Deloitte forecast last year.

The consultancy's 'Path to Prosperity' report said the economy had largely transitioned from manual skills towards cognitive skills, with the next step a move to what

Deloitte called 'skills of the heart'.

Skills such as customer service, conflict resolution and leadership were already in short supply across Australia, Deloitte said, and would be increasingly needed.

These skills favour women, Deloitte said.

"Women currently dominate the fastest growing jobs, the non-routine [creative] jobs of the head," the report said.

"Men dominate the jobs most susceptible to automation, manual occupations involving repetitive tasks.

"The existing female workforce is in the right place at the right time to benefit from these changes."

A practical example of the demand for caring occupations is in the health sector, where demand is likely to remain strong regardless of progress in automation.

### Ageing Australia

About a million Australians will be 85 years or older by 2034-35, double the level of 2015, according to the federal government's 2015 intergenerational report.

"By 2054-55 there are projected to be seven million Australians aged 65 to 84, compared with around 3.1 million in 2015," the report said.

"This would represent just under 18 per cent of the total population, compared with 13 per cent in 2014-15.

"In 1974-75, around 1.2 million persons were aged over 65, or around nine per cent of the population."

That would require a quadrupling of the aged care workforce by 2050, the Productivity Commission has forecast.

Business News' Data & Insights numbers show nearly 16,900 employees at the top 10 aged care providers in WA.



# to caring

Australians aged 65 to 84  
by 2055

**7 million +**

Source: Intergenerational Report

WA's share of LNG market

**12%**

Source: Department of Jobs, Tourism, Science and Innovation

Potential offshore carbon storage  
capacity in WA

**3.3 gigatonnes**

Source: Woodside

Global hydrogen production, 2050

**\$2.5 trillion**

Source: Bank of America

Federal data showed 522 vacancies for aged and disabled carers in WA in the three months to September 2020, up from 349 in the same period of 2010.

The ongoing Royal Commission into Aged Care Quality and Safety has sparked debate that could influence workforce size.

Unions have called for the staff-to-customer ratio at aged care facilities to be regulated, to ease pressure on the sector's workforce.

That could potentially drive demand for aged care workers.

There has been some push-back on the unions' suggestion, however, with consultancy Ansell Strategic lodging a submission to the royal commission arguing fixed ratios would limit flexibility to adjust to patient need.

"When resident acuity is low, staff are underutilised; this becomes both a taxpayer and consumer cost, because fixed rosters must be funded," the submission said.

"The practice can also create a culture of low productivity.

**\$98bn**

**WA IRON ORE  
EXPORTS 2019**

"[The] floor often becomes the ceiling, and static rosters create a risk to residents and staff when resources are stretched."

Regardless of the regulatory approach, healthcare and social assistance is expected to generate more new jobs than any other industry in WA in the next five years, according to federal data.

About 16,000 new roles will be needed, an increase of 10.3 per cent.

## Energy and exports

The resources sector is already the biggest contributor to WA's economy, with iron ore sales earning \$98 billion in 2019 and LNG around \$27 billion.

Combined, that's 43 per cent of the state's annual income.

Iron ore is likely to continue to be the biggest earner

## The existing female workforce is in the right place at the right time to benefit from these changes

- Deloitte 'Path to Prosperity' report

for decades, with BHP last year securing environmental approval to build a dozen mines over a 50-year period.

State government data shows WA was the second lowest cost producer of seaborne iron ore exports in 2019, after India, showing the industry has a competitive advantage.

Between them, WA's three biggest iron ore miners employ more than 33,000 people (see page 32).

LNG's workforce could grow in coming years with projects in the pipeline.

Development of the Scarborough gas field, a new processing train at Pluto and, longer term, the Browse project, are all on the agenda for Woodside Petroleum.

Data & Insights says about 1,800 construction jobs would be created by Scarborough and Pluto, with a further 720 operational jobs.

Browse would mean 3,200 construction jobs and support 600 operational roles, according to Data & Insights.

If the projects do not proceed, there's a possibility production may reduce.

A growing excess capacity is forecast at North West Shelf Venture's Karratha Gas Plant, with operator Woodside recently telling investors the facility would not have enough gas entering the plant to reach capacity.

About a quarter of capacity will be available in 2024.

Woodside has options, with some deals in negotiations.

But Karratha Train 3 would shut if the company fails to land on a deal.

More broadly, there's ongoing debate about the continued use of LNG as the world seeks to cut carbon emissions.

It's likely LNG will continue to have a role in WA's economy, while the industry could grow into opportunities in hydrogen production and carbon capture and storage.

Woodside announced in November it would target

carbon neutrality by 2050, although the Conservation Council of WA said it did not take the ambitions seriously.

Globally, natural gas use should likely decline between 13 per cent and 52 per cent by 2050, according to an International Panel on Climate Change's forecasts of mitigation pathways.

"But some pathways show a marked increase, albeit with widespread deployment of carbon capture and storage," the report said.

Skills from the LNG industry will have applications for hydrogen production and carbon capture and storage, as the world cuts emissions.

Bank of America predicts \$11 trillion could be invested in hydrogen infrastructure by 2050, with \$2.5 trillion of annual production.

"For the increasing number of countries signing legally binding pledges for net zero carbon emissions by 2050, the only viable clean molecule is hydrogen, which will play a major role in achieving these goals," the bank said in a September briefing note.

"Costs need to fall up to 85 per cent for green hydrogen to compete with fossil fuel-derived hydrogen, which should happen by 2030.

"Furthermore, governments, such as the European Union, China, and Australia, are starting to provide strong policy support, through increased carbon prices and funding to develop the fuel."

Bloomberg's 'New Energy Outlook' in October forecast at least \$14 trillion would be spent on hydrogen manufacturing, transport and storage by 2050 to keep global warming below 2 degrees.

The state government has an ambition that WA's market share in global hydrogen exports will be similar to its share of LNG exports by 2030: about 12 per cent of the market.

For context, the four LNG operators in WA employ about 8,500 people, according to Data & Insights.

But the green hydrogen industry is not yet competitive.

That means replacing LNG with hydrogen in the near term would necessitate replacing an income earning export with one requiring support from other parts of the economy.

Then there's carbon capture and storage.

Chevron has already made an early move in this space at the Gorgon LNG facility, with a CCS plant that hit teething issues.

Woodside has flagged the potential to set up a carbon abatements business, highlighting huge storage potential in WA.

Once drained of gas, subsea reservoirs such as Pluto, Browse and in the North West Shelf fields could sequester about 3.3 gigatonnes of carbon dioxide, about seven years' worth of Australian emissions.

WA could be the world's carbon storage hub.

Beyond hydrogen and carbon capture, WA is already positioning for projected growth in battery manufacturing.

McKinsey predicts battery demand to grow roughly 17-fold from 2019 to 2030, largely driven by electric mobility uses.

That would likely drive demand for commodities such as lithium, and downstream manufacturing opportunities.

Production of lithium, tantalum and tin employed about 2,550 full time equivalent workers in WA in the 2020 financial year, according to state government data, down from 4,850 in the year to June 2019.

A new lithium refinery is under construction and another is likely, although one near-complete refinery has been delayed indefinitely.

But it's not clear how far WA can move beyond that.

An analysis by the Chamber of Commerce and Industry of WA released in late 2018 said the state could struggle to move beyond chemical production to making cathode materials.

Cathode making was highly competitive, would require imports, and would face high capital and operating costs, including energy, CCI said.

All of that indicates that the battery sector won't surpass iron ore in employment numbers any time soon.

# BIGGEST EMPLOYERS 2020

\*Number of Staff in WA

## BUSINESSES

Company	*Total staff	Company	*Total staff
Woolworths Group	16,604	V&V Walsh	1,000
BHP	14,118	Collins Foods	1,000
Rio Tinto	12,930	Minara Resources	950
Wesfarmers	12,402	Centurion	910
Coles	12,200	Seven West Media	909
McDonald's Australia	8,405	Piacentini & Son	878
Fortescue Metals Group	6,448	GHD	873
Crown Towers Perth	6,000	Glencore	816
Sodexo	4,500	RAC Arena	800
Ventia	4,400	Shell	800
NRW Holdings	4,231	Mader Group	800
Monadelphous	4,000	Ray White	512
Woodside Petroleum	3,802	PGC Resources	756
Alcoa of Australia	3,750	Thiess	NFP
Compass Group	3,455	EY	714
Downer EDI	3,100	Goodline	700
Mineral Resources	3,100	Deloitte	697
Spotless	3,000	DVG Automotive Group	680
CITIC Pacific Mining	3,000	Professionals Real Estate Group	650
Roy Hill Holdings	2,800	Western Areas	650
Perenti	2,740	Kinetic IT	878
Byrnecut	2,730	CPB Contractors	NFP
ESS Support Services Worldwide	2,676	Harvest Road Group	625
Craveable Brands	2,535	Linfox	NFP
VenuesLive	2,500	PwC	600
WesTrac	2,500	SRG Global	600
Serco Australia	2,250	Delaware North	581
Macmahon Holdings	2,212	Modis	572
UGL	2,200	Bright Group	565
Newmont Corporation	2,187	AngloGold Ashanti	543
Chevron	2,000	John Hughes Group	538
Worley	2,000	Aurizon	520
Toll Group	2,000	D'Orsogna	500
South32	1,963	Navitas	500
Linkforce	1,800	Calibre	500
Telstra Corporation	NFP	Holcim	500
Newcrest Mining	1,503	GenusPlus Group	500
Bakers Delight	1,500	Catholic Homes Inc	496
AusGroup	1,500	ACTON Real Estate	485
Gold Fields	1,500	OCS Services	480
ISS Facility Services	1,500	ASC	450
Civmec	1,500		
QUBE Holdings	1,500		
MACA	1,491		
Bis	1,300		
Northern Star Resources	1,295		
Kalgoorlie Consolidated Gold Mines	1,250		
Altrad Services	1,200		
Wilson Parking	1,185		
Inpex	1,178		
Galati Group	1,154		
Chicken Treat	1,100		
ABN Group	1,100		
Austal	1,076		
CFC Group	1,062		
Tronox	1,062		
Westgold Resources	1,050		
Wood plc	1,010		

## GOVERNMENT

Entity	*Total staff
Department of Education	40,571
Department of Health	36,431
WA Police Force	9,307
Department of Justice	6,473
Department of Communities	5,657
Australia Post	2,879
Water Corporation	2,819
Western Power	2,750
Public Transport Authority of WA	2,024
Department of Biodiversity Conservation and Attractions	1,933
Department of Fire and Emergency Services	1,638
Department of Primary Industries and Regional Development	1,560
Department of Mines Industry Regulation and Safety	1,579
Department of Transport	1,354
Main Roads Western Australia	1,095
City of Wanneroo	992
Department of Finance	931
Synergy	895
City of Stirling	894
Department of Local Government Sport and Cultural Industries	919
Department of Water and Environmental Regulation	851
City of Perth	754
Department of Planning Lands and Heritage	747
City of Gosnells	694
City of Swan	693
City of Mandurah	643
City of Joondalup	632
City of Cockburn	582
City of Canning	566
City of Rockingham	543

## BANKS

Entity	*Total staff
Bankwest	3,250
Westpac Banking Corporation	1,969
Commonwealth Bank of Australia	1,500
ANZ Banking Group	NFP
National Australia Bank	NFP
P&N Bank	330

## NOT-FOR-PROFIT

Entity	*Total staff	Entity	*Total staff	Entity	*Total staff
St John of God Health Care	8,436	MercyCare	1,280	RAAFA WA Division	740
Aegis Aged Care Group	3,400	Avivo	1,200	Salvation Army	NFP
Silver Chain	3,237	CBH Group	1,100	YWA	627
Activ Foundation	2,251	Southern Cross Care WA	1,000	Swan Christian Education Association	648
Brightwater Care Group	2,054	Opal Aged Care	1,000	Telethon Kids Institute	645
Bethanie	1,938	Ability Centre	977	Rise Network	638
Juniper	1,930	HBF	962	Regents Garden Group	611
St John Ambulance WA	1,791	Rocky Bay	959	Anglicare WA	573
Amana Living	1,640	Regis Aged Care	900	Good Samaritan Enterprises	551
Royal Automobile Club of WA	1,574	MSWA	810	Identitywa	538
Hall & Prior	1,400	Autism Association of WA	784	Acacia Living Group	481
Baptistcare	1,400	Nulsen Group	783		

## Data &amp; Insights

## HOSPITALS

Entity	*Total staff
<b>ST JOHN OF GOD HEALTH CARE</b>	
St John of God Midland Public and Private Hospitals	<b>2,398</b>
St John of God Subiaco Hospital	<b>2,083</b>
St John of God Murdoch Hospital	<b>1,908</b>
St John of God Mt Lawley Hospital	<b>635</b>
St John of God Bunbury Hospital	<b>610</b>
St John of God Geraldton Hospital	<b>174</b>
<b>GOVERNMENT HOSPITALS</b>	
<b>North Metropolitan Health Service</b> (including: Sir Charles Gairdner Hospital, Osborne Park Hospital, King Edward Memorial Hospital, Joondalup Health Campus, Graylands Hospital)	<b>8,943</b>
<b>WA Country Health Service</b>	<b>8,338</b>
<b>East Metropolitan Health Service</b> (including: Armadale Health Service, Kalamunda District Community Hospital, Royal Perth Hospital, Bentley Hospital, St John of God Midland Public Hospital)	<b>8,549</b>
<b>South Metropolitan Health Service</b> (including: Fiona Stanley Hospital, Fremantle Hospital, Rockingham General Hospital / Murray District Hospital, Peel Health Campus)	<b>7,133</b>
<b>Child and Adolescent Health Service</b> (including Perth Children's Hospital and KEMH Neonatology service)	<b>3,448</b>
<b>RAMSAY HEALTH CARE</b>	
Joondalup Health Campus	<b>3,519</b>
Hollywood Private Hospital	<b>2,089</b>
Peel Health Campus	<b>936</b>
Glengarry Private Hospital	<b>282</b>
Attadale Private Hospital	<b>86</b>

## TERTIARY EDUCATION

Entity	*Total staff
Edith Cowan University	<b>4,566</b>
University of Western Australia	<b>3,840</b>
Curtin University	<b>3,766</b>
Murdoch University	<b>3,282</b>
North Metropolitan TAFE	<b>1,700</b>
South Metropolitan TAFE	<b>1,430</b>
South Regional TAFE	<b>678</b>
The University of Notre Dame Australia	<b>618</b>

## WA's STATE GOVERNMENT BUSINESSES

Ranked by total revenue



Rank	Change	Company	Senior executive and title	Total revenue (\$) a) 19/20 b) 18/19	Profit/loss (\$) a) 19/20 b) 18/19	Total assets (\$) a) 19/20 b) 18/19
1	—	<b>Gold Corporation</b>	Mr Richard Hayes Chief executive	a) 23.87bn b) 18.07bn	<b>a) 58.2m b) 13.7m</b>	a) 7.15bn b) 4.76bn
2	—	<b>Synergy</b>	Mr Jason Waters Chief executive	a) 3.02bn b) 2.99bn	<b>a) -27.2m b) -656.9m</b>	a) 2.05bn b) 1.70bn
3	—	<b>Water Corporation</b>	Mr Pat Donovan Chief executive	a) 2.85bn b) 2.76bn	<b>a) 809.0m b) 791.0m</b>	a) 18.59bn b) 17.77bn
4	↑	<b>Western Power</b>	Mr Ed Kalajzic Chief executive	a) 1.84bn b) 1.77bn	<b>a) 391.0m b) 366.0m</b>	a) 11.41bn b) 11.27bn
5	↑	<b>Western Australian Treasury Corporation</b>	Ms Kaylene Gulich Chief executive	a) 1.38bn b) 1.63bn	<b>a) 28.5m b) 29.2m</b>	a) 64.66bn b) 59.48bn
6	↑	<b>Lotterywest</b>	Ms Susan Hunt Chief executive	a) 1.02bn b) 1.05bn	<b>a) -7.9m b) 31.5m</b>	a) 348.4m b) 366.4m
7	—	<b>Insurance Commission of Western Australia</b>	Mr Rod Whithear Chief executive	a) 897.3m b) 886.3m	<b>a) -2.9m b) 203.8m</b>	a) 5.74bn b) 5.86bn
8	↓	<b>GESB</b>	Mr Ben Palmer Chief executive	a) 766.8m b) 1.06bn	<b>a) -555.3m b) 615.4m</b>	a) 33.72bn b) 33.91bn
9	—	<b>Horizon Power</b>	Ms Stephanie Unwin Chief executive	a) 536.1m b) 559.9m	<b>a) 8.9m b) 35.9m</b>	a) 1.80bn b) 1.78bn
10	—	<b>Pilbara Ports Authority</b>	Mr Roger Johnston Chief executive	a) 465.7m b) 441.8m	<b>a) 131.7m b) 126.3m</b>	a) 2.82bn b) 2.70bn
11	—	<b>Racing and Wagering Western Australia</b>	Mr Ian Edwards Acting CEO	a) 332.4m b) 328.0m	<b>a) 19.5m b) -3.1m</b>	a) 201.6m b) 164.9m
12	↑	<b>DevelopmentWA</b>	Mr Frank Marra Chief executive	a) 271.7m b) 261.7m	<b>a) 3.5m b) 6.8m</b>	a) 1.32bn b) 1.18bn
13	↑	<b>VenuesWest</b>	Mr David Etherton Chief executive	a) 248.8m b) 261.7m	<b>a) 28.7m b) 1.4m</b>	a) 2.17bn b) 2.22bn
14	↑	<b>Fremantle Ports</b>	Mr Chris Leatt-Hayter Chief executive	a) 217.9m b) 222.0m	<b>a) 46.2m b) 49.4m</b>	a) 590.1m b) 565.6m
15	↑	<b>Southern Ports Authority</b>	Mr Steven Lewis Chief executive	a) 149.5m b) 114.1m	<b>a) 39.0m b) 22.9m</b>	a) 286.7m b) 250.1m
16	↓	<b>Landgate</b>	Mr Graeme Gammie Chief executive	a) 133.1m b) 300.7m	<b>a) -13.4m b) 149.4m</b>	a) 650.5m b) 237.5m
17	↓	<b>Forest Products Commission</b>	Mr Stuart West General manager	a) 128.6m b) 126.3m	<b>a) 0.6m b) -1.6m</b>	a) 311.7m b) 321.2m

18  
28

Data &amp; Insights

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### Data & Insights

Showing 6 of 2,481

#### Healthy future for hospital jobs

State Government's Future Jobs, Future Skills strategy which predicts an increase in new types ... set to create hundreds of new jobs in Western Australia, fuelling the nation's fastest-growing ... been the primary provider of new jobs in the Australian labour market since the 1990s. Ramsay Health ...

#### Broader investment tax break to lift jobs

Steve Thomas told ABC radio the party needed to provide a vision for the future. He conceded voters had ... parliament and hopes to be a "senior member in a future Liberal government". Health Minister Roger ...

#### Fortescue targets renewables future

Female unemployment has drawn considerable attention during the COVID-19 pandemic, with ... Bureau of Statistics data. While men lost jobs at a similar rate over the same period, latest ABS data ...

#### How mining companies are reframing their future for growth

in skills development - where more jobs and more interesting jobs would be required in the future ... By Scott Grimley Thought Leadership Mining's contribution to jobs and supporting the broader ... to Operate will be critical to future growth opportunities. Starting with fundamental matters like ...

#### Treasurer aims to save jobs, businesses

The laws, first announced in September, ... after the steep seven per cent contraction in June quarter. However, future quarters are not so clear. ... forecasts. In parliament, Mr Frydenberg was asked by shadow treasurer Jim Chalmers to confirm jobs were lost ...

#### Climate inaction puts 880,000 jobs at risk

Australia could lose \$3 trillion and 880,000 jobs over the next ... climate change," he said. Deloitte said climate action would create 250,000 jobs and grow the economy ... government's technology investment road map would create jobs, cut costs and reduce emissions.

