Mining and Automotive Skills Alliance

Executive Summary Industry Workforce Plan

Moving ahead together

2024

Mining and Automotive Skills Alliance

Acknowledgement of Country

In delivering our 2024 Workforce Plan we acknowledge the Traditional Custodians of the lands on which we live and work.

We acknowledge Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

Workforce Plan 2024. Version 1.2
August 2024

Featured Image: Ptilotus Exaltatus

Mining and Automotive Skills Alliance

CEO foreword

Building on our Initial Workforce Plan 2023 – *The Future is Now*, I am proud to present AUSMASA's Workforce Plan for 2024 – *Moving Ahead Together*. This plan brings together our key activities, projects, and priorities and explores a range of new economic insights and contemporary workforce data in support of the mining and automotive industries.

The mining and automotive industries have a long and rich history in Australia. They are innovative industries that are actively engaging in initiatives to support Australia's net zero ambitions and establish new sustainable pathways to strengthen and secure domestic supply and value chains. Challenges such as these and their associated innovative solutions will not be realised without fit-for-purpose vocational education and training (VET) and workforce planning. Without this, we risk further skills shortages in these (and associated) industries.

AUSMASA is enthusiastically and impactfully tackling challenges faced by the VET sector, employers, and unions. Within this work, our 10-point Strategic Plan developed at our *Critical Minerals and Electric Vehicle Skills Forum 2023* stands out as a combined, future-focused example of how we can progress innovative solutions to key challenges common to the mining and automotive workforces. We build on this success in this Workforce Plan.

Our stakeholder work needs to be underpinned by up-to-date data and evidence to identify and meaningfully address workforce challenges – which is the role of this Workforce Plan. This year's plan includes updated and deeper industry-level workforce data on demographics, educational attainment, occupation types, and improved time series data on workforce size and projections out to the 2030s. Coupled with existing VET data on specific training packages, this plan provides a broader and more granular evidence base of workforce and student-level data to identify and help propose solutions to workforce challenges faced by our industries.

As AUSMASA continues to deepen its workforce planning, stewardship, and other functions, the team and I look forward to continuing our work with our education, industry, and workforce stakeholders to address critical and emerging issues for these important industries.

I hope you find this workforce plan valuable in your work. Thank you for your ongoing commitment and support; we look forward to moving ahead together!

Dr Gavin Lind

Chief Executive Officer

Executive summary

The Mining and Automotive Skills Alliance (AUSMASA), the Jobs and Skills Council for Australia's mining and automotive sectors, is pivotal in identifying and addressing these industries' workforce needs. By collaborating with stakeholders, AUSMASA aims to ensure vocational education and training (VET) systems align with the evolving demands of both sectors. AUSMASA's 2024 Workforce Plan identifies several focus areas, which AUSMASA will continue to advance. These focus areas are outlined in the summary of identified areas of focus of this report.

With a combined workforce of approximately 632,700 workers, AUSMASA's industry coverage includes the entire mining and most of the automotive workforce within the Australian and New Zealand Standard Industry Classification (ANZSIC) system. This workforce is projected to grow by over 72,000 workers over the coming decade (~31,000 for mining, ~10,000 for oil and gas extraction and ~31,000 for the automotive industry).[1] AUSMASA provides a focused insight into individual sub-divisions within the mining and automotive industries, analysing trends, drivers, challenges, and opportunities. These sub-divisions are:

Mining Sub-Divisions

- **Coal Mining**
- **Metal Ore Mining**
- **Non-Metallic Mineral Mining and Quarrying**
- **Exploration and Other Mining Support Services**
- **Oil and Gas Extraction**

Automotive Sub-Divisions

- **Automotive Retail and Wholesale**
- **Automotive Repair and Maintenance**
- **Automotive Manufacturing**

Considering the national economic setting, characterised by robust population growth and high workforce participation rates, AUSMASA recognises the imperative of addressing productivity challenges to sustain economic growth. Through targeted initiatives, AUSMASA seeks to ensure a skilled and resilient workforce capable of meeting the evolving needs of the mining and automotive industries in the changing economic landscape.

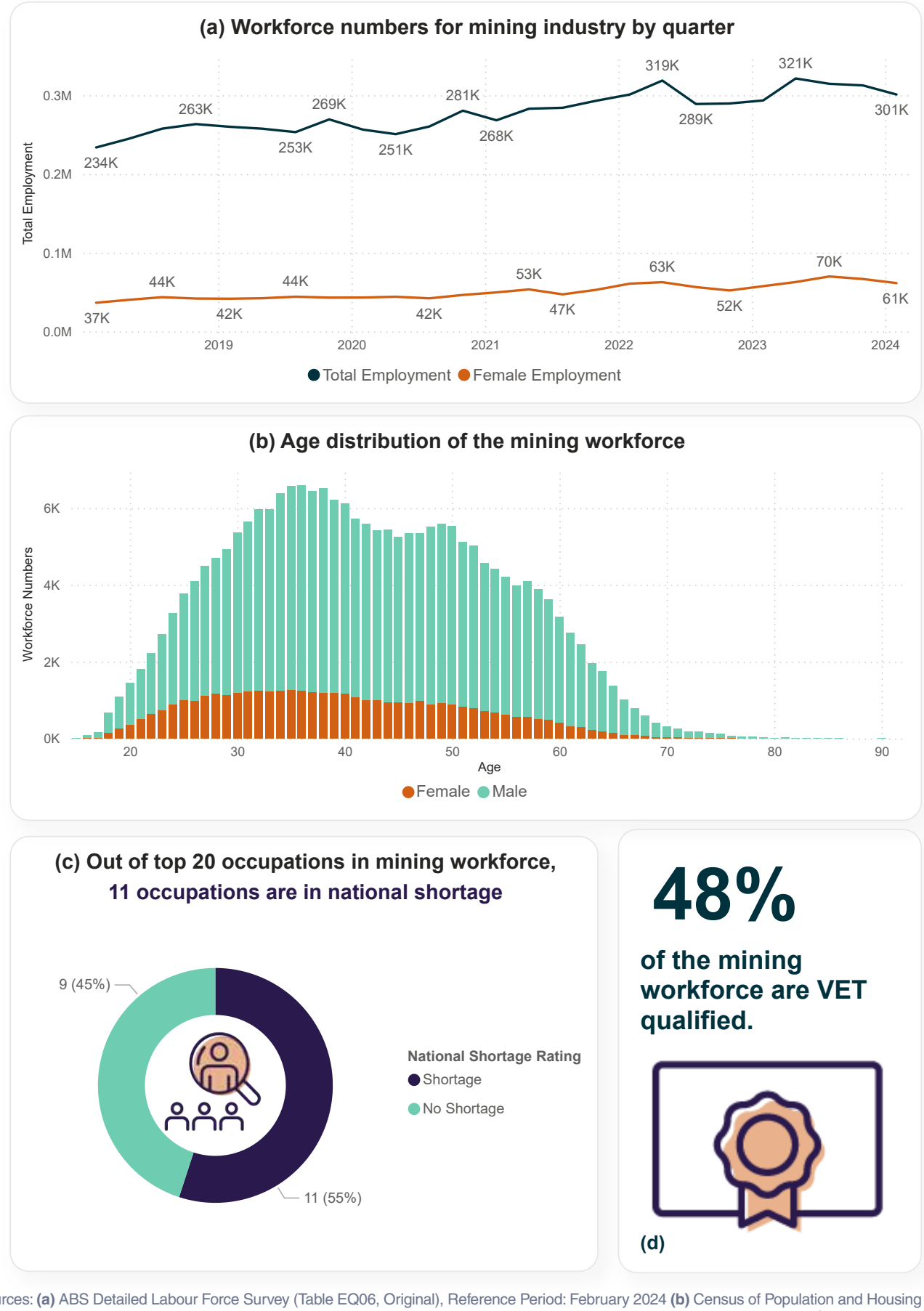
AUSMASA has initiated projects to enhance workforce capabilities in response to industry priorities. These projects include developing training resources for autonomous workplace operations, reviewing emergency response qualifications, identifying and updating superseded units of competency across training packages and commencing the process of mapping the industries' required skills and career pathways to better inform future bodies of work.

AUSMASA is building on its recent research into understanding youth perceptions of mining by undertaking similar market research to understand youth perceptions of automotive careers. AUSMASA is also exploring strategies to attract and retain talent in both industries, including via skilled migration and education pathways.

1 Jobs and Skills Australia. *'Employment Projections'.* 2023

Mining industry snapshot

Figure 1: Mining Industry Snapshot Dashboard



Sources: **(a)** ABS Detailed Labour Force Survey (Table EQ06, Original), Reference Period: February 2024 **(b)** Census of Population and Housing (AGEP Age and SEXP Sex), 2021, TableBuilder **(c)** ABS Table Builder 2021 Census - INDP Industry of Employment, OCCP Occupation | JSA Skills Priority List 2023. 4-dig SPL(ANZSCO 2013) **(d)** Census of Population and Housing (HEAP Level of Highest Educational Attainment), 2021, TableBuilder

The mining industry

The mining industry experienced significant growth, particularly during the 21st-century mining boom when the workforce increased by over 200,000 between 2004 and 2024 and 56,000 between 2020 and 2024, Figure 1, to its current size of almost 312,500 (four-quarter average from May 2023 to February 2024). This growth was driven by the rising demand for industrial and energy commodities from emerging markets. A skilled workforce, innovative technologies, and a stable policy environment supported this growth, making Australia a global leader in mining and resources. This historic growth is projected to continue with the combined mining and oil & gas extraction workforce projected to reach 353,600 by 2033 (a growth of over 41,000 workers: ~31,000 for mining and ~10,000 for oil and gas extraction).[2]

The industry's substantial contributions to the Australian economy are evident. Mining has been the largest source of economic growth in recent years, directly providing a significant portion of the GDP with only 2% of the national workforce. Australia has attracted substantial mining investment, with many of the world's largest mining companies operating in the country, drawn by its geological potential and favourable policies. Mining's export revenue plays a crucial role in Australia's economy, with mineral, metal, and energy commodities accounting for a significant portion of the country's total export income. Beyond its direct economic impact, the mining industry supports a vast domestic supply chain, generating additional employment opportunities across various sectors.

Despite its past success, the mining industry faces many challenges, including transitioning to net zero, declining ore grades, societal expectations, and improving labour productivity. To address these challenges and ensure future sustainability, the industry must focus on skills development, workforce retention, and adopting new technologies to enhance productivity and environmental outcomes.

Coal mining

Australia's coal mining sector has long been a cornerstone of the nation's economy. It boasts a global competitive advantage through its high-quality coal and is a major source of employment and export income.

Concentrated primarily in Queensland and New South Wales, with additional operations in Western Australia, Victoria, and Tasmania, the industry employs over 50,000 individuals directly and generates substantial additional employment opportunities through its regional supply chains.

2 Jobs and Skills Australia. *'Employment Projections'.* 2023

The industry faces significant skill shortages, particularly in critical occupations. One potential solution to these shortages is to attract more women into the workforce. By increasing female participation, the industry can tap into a broader talent pool, thereby addressing the current skill gaps. Additionally, fostering a more inclusive environment can lead to diverse perspectives and innovative solutions, further strengthening the industry's capacity to meet its demands.

While coal remains a major export and source of energy, it is under pressure due to global efforts to reduce reliance on fossil fuels. This transition presents workforce transformation challenges, with initiatives underway to support affected communities and facilitate reskilling for new job roles in clean energy sectors. Opportunities may arise in emerging sectors like critical minerals, but the VET sector must be ready to adapt to evolving demands.

Metal ore mining

Australia's metal ore mining sector is a global powerhouse driven by its rich mineral reserves and advanced mining technologies.

Metal ore mining occurs across Australia, with key mining hubs like the Pilbara, Kalgoorlie gold fields, and Mt Isa region driving demand for skilled workers. Western Australia accounts for the majority (62%) of the metal ore workforce. The metal ore mining workforce has experienced steady growth, reaching 143,300 in 2024 and is projected to increase to 175,000 by 2032. Skills shortages persist, particularly in key occupations, posing a challenge to the sector's expansion.

The sector has embraced cutting-edge technologies to enhance productivity and efficiency. Remote or automated transportation systems, such as those used in the Pilbara region, exemplify this trend, enabling remote management of mining operations and fostering workforce diversity.

Efforts are being made to attract and support a more diverse workforce, including via increased female participation. Challenges remain, such as a low proportion of younger workers in the sector.

The sector relies heavily on VET-based qualifications, but enrolments for relevant qualifications have declined since 2015. Addressing this decline and ensuring workforce readiness for emerging technologies are high priorities.

Critical minerals

Australia's Critical Minerals Strategy aims to position the country as a global leader in the critical minerals sector. The strategy aims to develop diverse, resilient, and sustainable supply chains through robust international partnerships and build Australia's sovereign capability in critical minerals. By

leveraging these critical minerals, Australia seeks to become a renewable energy superpower, extracting more value onshore. This approach not only boosts job creation and economic opportunities but also benefits regional and First Nations communities. Delivering on the Critical Minerals Strategy objectives will require addressing skills shortages, identifying skills gaps and investing in training.

Non-metallic mineral mining and quarrying

Australia's non-metallic mineral mining and quarrying industry plays a crucial role in supplying raw materials for the construction sector.

With nearly 1,900 quarries across Australia, this sector supplies construction materials like stone, sand, gravel, limestone, and gypsum. Most quarries in Australia are small operations. The demand for roles in this industry is closely tied to the building and construction sector, which is forecast to experience growth in the coming years. The non-metallic mineral and quarrying workforce have experienced strong growth in recent years. The workforce data captures lithium and mineral sands mining. Consequently, the workforce growth is likely linked to the expansion of lithium and mineral sands operations, particularly in Western Australia.

Like other mining sectors, the non-metallic mineral and quarrying sector faces skills shortages, with several key occupations experiencing high demand. National vacancy levels for roles such as truck drivers and drillers are above pre-COVID levels, indicating a strong rebound in the industry. The sector has more female employees than other mining sectors, at 26%. The sector faces challenges related to an ageing workforce, with a median age of 45 and a higher proportion approaching retirement than entering the industry.

Oil and Gas Extraction

The Oil and Gas Extraction industry is a significant economic contributor to Australia. The industry was valued at $130 billion in 2023, with gas accounting for 87% of this value. The industry has grown from primarily serving domestic demand in the 1980s to becoming the world's second-largest exporter of Liquefied Natural Gas (LNG) by 2022.

The industry is vertically integrated and encompasses exploration, extraction, refining, and transportation. Offshore extraction mainly occurs off Western Australia and in the Bass Strait, while coal seam gas (CSG) is predominantly extracted in Queensland and New South Wales.

The workforce has declined from 32,600 in 2018 to 17,600 in 2024 but is projected to rebound to 29,700 by 2033. Skills shortages are prevalent, with many required occupations overlapping with the broader mining industry. Western Australia has the largest workforce share (44%), followed by

Queensland (31%). The industry has a low female representation (18%) and an older workforce, with a median age of 42. A significant portion (47%) of the workforce requires at least a bachelor's degree, reflecting the specialised skills needed.

Exploration and other mining support services

The exploration and other mining support services sector in Australia is fundamental to the success of the mining industry and the economy. Mineral exploration is essential for discovering and unlocking Australia's mineral wealth. Skilled geoscientists and exploration professionals play a vital role in this process, contributing to the long-term success of the mining industry and the economy.

Much of the workforce is in Western Australia, followed by Queensland and South Australia. The sector has a diverse workforce, with 21% representation of women and a reliance on higher education qualifications and vocational training.

The exploration and mining support services workforce has been steadily expanding, with a projected 8% growth by 2033. The sector faces challenges related to skills shortages, particularly in highly specialised roles such as geologists, geophysicists, and hydrogeologists.

Occupations within the exploration drilling sector offer unique opportunities for workers seeking variety, high pay, and manual labour. The sector experiences higher staff turnover rates due to harsh working conditions, transiency, and the cyclical nature of commodity pricing.

Mining industry trends and priorities

The mining industry in Australia faces several challenges and priorities that need to be addressed to ensure its continued success and positive impact on the economy.

Every mining industry sector is experiencing skills shortages, especially in the top 11 to 20 occupations by employee numbers, Figure 1. Attracting and retaining new workers is crucial for the industry's growth, but recruitment difficulties persist, with 52% of employers reporting challenges in filling roles. Despite increased demand, engineering and earth sciences-related degree enrolments have been declining. Initiatives like degree apprenticeships could help attract and retain students in specialised fields like mining engineering and geology.

The mining industry's image is influenced by changing societal expectations, environmental concerns, and incidents like the destruction of sacred Indigenous sites. Efforts to improve a range of perceptions, especially

among younger generations, are crucial for attracting talent to the industry. Unlike previous generations, Generation Z is the first to prioritise workplace flexibility and purpose over remuneration when choosing a career path or industry, meaning the mining industry will need to do more than just offer high wages to attract talent.

The industry has seen increased female representation but still lags in gender pay equality and female enrolment in relevant qualifications. Addressing these gaps and promoting diversity and inclusion are essential for a sustainable workforce. High drop-off rates in apprenticeships and traineeships pose challenges for the industry. To reverse this, improving mentoring and coaching, addressing trainer shortages, and supporting apprentices are priorities. Migration plays a vital role in filling skills gaps, but barriers like housing shortages and global competition hinder its effectiveness. Addressing these challenges and streamlining skilled migration processes may well benefit the industry.

Technological advances like digitisation and automation are changing how mining work is done, creating new job opportunities and requiring higher digital skills. The mining sector is increasingly adopting advanced technologies to improve productivity and safety, including data analytics, continuous asset monitoring, robotics, and AI systems. As technology evolves, new and emerging job roles require advanced technical skills and education. Retraining and reskilling the whole workforce will be crucial in managing this transition.

The mining industry is transitioning towards more sustainable operations, including adopting electric or diesel-electric mobile plant equipment to reduce carbon emissions. While hydrogen-powered solutions are also considered, electrification presents a more efficient option for some companies, especially where infrastructure is already in place.

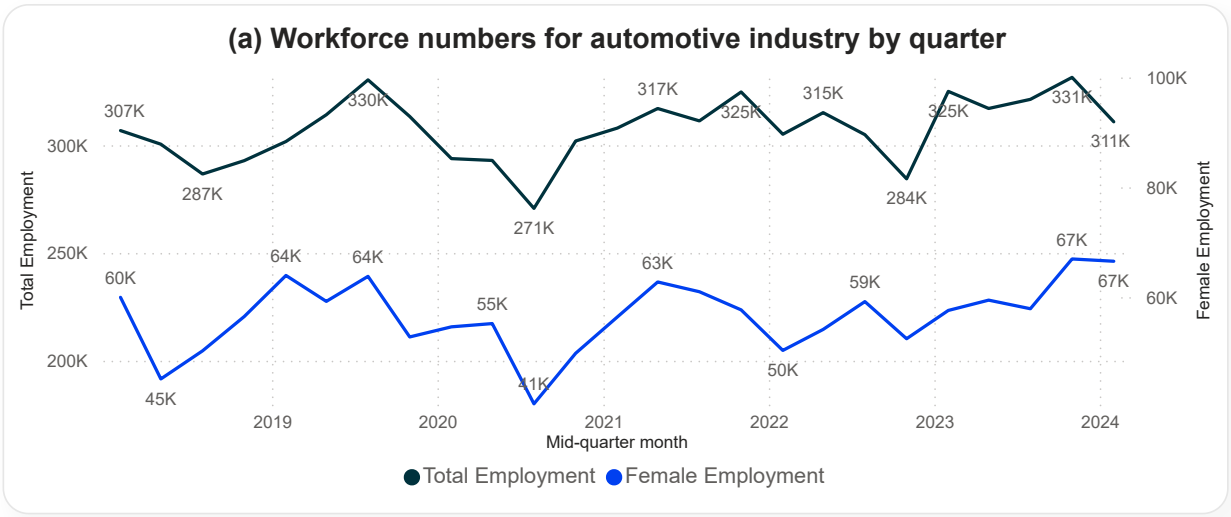
Mine rehabilitation and closure and oil and gas decommissioning activities are needed as mines and wells reach the end of their operational life. When closed effectively, they will contribute to the industry's environmental credentials. This requires many skills, including traditional trades, multiple engineering disciplines, environmental knowledge, and First Nations cultural awareness. Training programs tailored to this phase of a mine and wells life are essential to meet workforce needs.

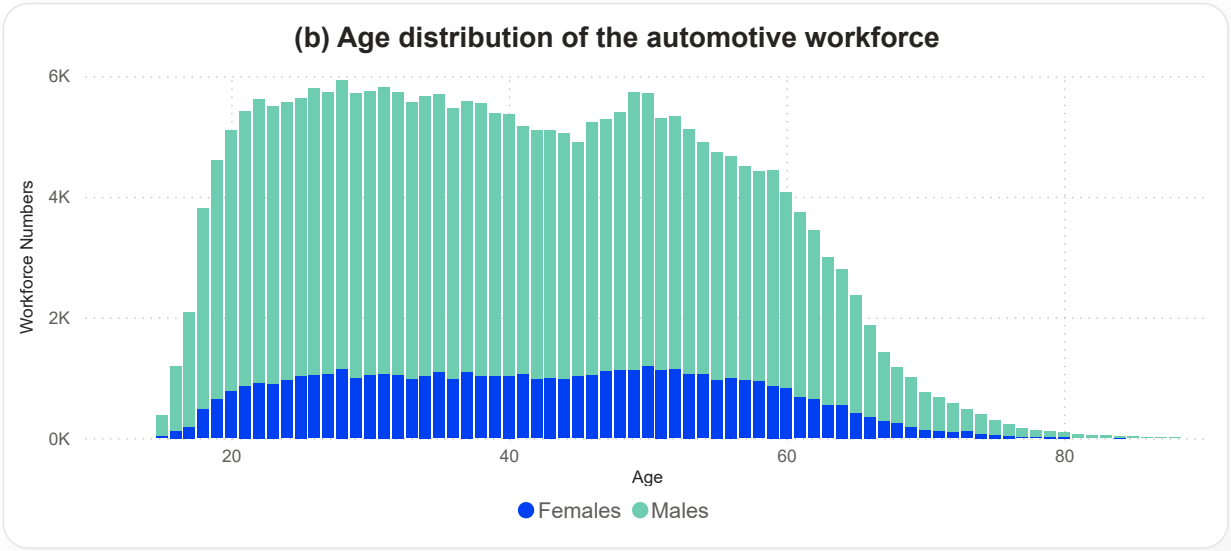
Cultural reform initiatives aim to transform workplace values and behaviours to foster safety, diversity, equity, and inclusion. Efforts to prevent sexual harassment, bullying, and racism are critical. Training programs and collaborations with government agencies and educational institutions are essential to promote cultural reform in the mining industry.

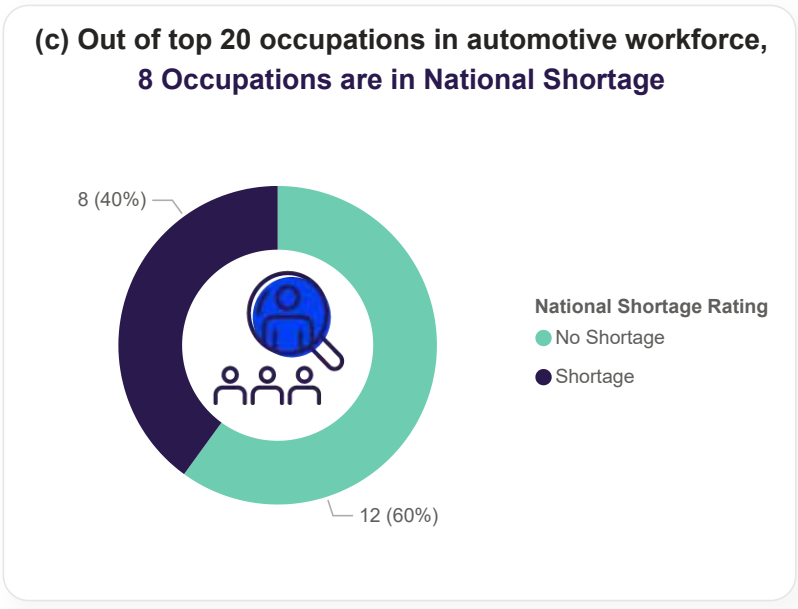
First Nations Australians play a vital role in the mining industry, and there is a growing focus on increasing their representation and involvement. Government initiatives and industry partnerships aim to create employment opportunities and ensure social and cultural accountability. Training and employment programs tailored to First Nations communities are essential for fostering participation and success.

Automotive industry snapshot

Figure 2: Automotive Industry Snapshot Dashboard







52%

of the Automotive Workforce are VET Qualified

(d)

Sources: **(a)** ABS Detailed Labour Force Survey (Table EQ06, Original), Reference Period: February 2024 **(b)** Census of Population and Housing (AGEP Age and SEXP Sex), 2021, TableBuilder **(c)** ABS Table Builder 2021 Census - INDP Industry of Employment, OCCP Occupation | JSA Skills Priority List 2023. 4-dig SPL(ANZSCO 2013) **(d)** Census of Population and Housing (HEAP Level of Highest Educational Attainment), 2021, TableBuilder

The automotive industry

Australia's automotive industry is a significant economic force, generating about $174 billion in 2022 –23 and expected to grow to over $185 billion annually within 5 years. The industry's revenue primarily comes from imported vehicle sales and a robust domestic market for parts and accessories. Transitioning from traditional vehicle manufacturing, the industry now focuses on specialised production such as high-tech engineering and component manufacturing, maintaining its relevance in the global market despite the end of large-scale car manufacturing in 2017.

The industry, employing over 320,200 workers (four-quarter average from May 2023 to February 2024), is evolving with a steady shift towards electric vehicles (EVs) and advanced technologies, aligning with global sustainability goals and responding to consumer demand for innovative transport solutions. 2023 saw record vehicle sales, boosted by increased sales of EVs and hybrids. This growth in demand is reflected in the projected workforce growth of over 31,000 more workers by 2033.[3]

Challenges like skill shortages and the need for continual technological adaptation are prevalent, yet there are opportunities for growth in the EV and hydrogen technology sectors. Significant enrolments in vocational education and training support the demand for skilled workers, while also emphasising the necessity of aligning workforce skills with technological advancements in the automotive field.

Automotive retail and wholesale sector

The automotive retail and wholesale sector[4] in Australia employs over 124,000 individuals. It encompasses a broad range of activities including selling vehicles, trucks, buses, motorcycles, bicycles, and related parts and accessories. The sector is well-represented nationwide, aligning with population distributions and offering employment opportunities in urban and remote areas. The sector includes over 3,575 car dealerships, 697 motorcycle dealerships, 532 caravan and trailer dealerships, and approximately 1,000 bicycle retailers. These establishments often cluster in metropolitan areas, creating hubs that spur local employment and support services like parts and tyre shops.

Licensing requirements for vehicle salespersons vary by state. They involve

3 Jobs and Skills Australia. *'Employment Projections'.* 2023.

4 NOTE: While AUSMASA is providing data and a narrative on the automotive wholesaling sector as part of its 2024 Workforce Plan, it should be noted that this sector is officially the responsibility of the Service and Creative Skills Australia (SaCSA) Jobs and Skills Council. The automotive wholesaling sector is expected to become officially part of AUSMASA's responsibility prior to the 2025 Workforce Plan.

some training but do not necessarily culminate in a formal qualification. The AUR31020 Certificate III in Automotive Sales offers a more structured educational pathway, often pursued through traineeships.

Despite a stable workforce size over the past 5 years, the workforce is projected to grow modestly to 133,600 workers within the next 9 years due to changing consumer behaviours, such as the increased reliance on online vehicle reviews and purchasing. The sector is gradually shifting from traditional sales roles to more digital and service-oriented roles due to the growing trend of online vehicle customisation and purchase, particularly with EV brands like Tesla and BYD leading this change.

The workforce is relatively young, with a significant portion under 26, and shows a higher female participation rate than other industry sectors. Educational levels vary, with many holding secondary education qualifications or completing vocational training in automotive sales.

Automotive repair and maintenance sector

The automotive repair and maintenance sector is a crucial part of Australia's automotive industry, employing 158,500 workers across various specialties such as auto electrics, mechanical servicing, and body repairs. This sector, which includes over 27,70 service and repair workshops, has seen an 11.5% increase since 2021, indicative of the growing vehicle numbers and demand for maintenance services.

Most of these workshops are independently operated, with a significant portion being small businesses, indicating a diverse and decentralised industry structure. The sector faces a persistent challenge of skills shortages, with critical roles like motor mechanics, panel beaters, and vehicle painters in high demand but low supply. This shortage is compounded by the sector's struggle to attract new workers due to relatively low wages compared to other trades.

The sector is also seeing a shift in how services are provided, largely due to the increasing number of vehicles and advancements in autonomous vehicle systems and automotive technology. This includes the rise of electric and hybrid vehicles, which require new skills and training programs to ensure technicians are prepared for the evolving landscape of automotive technology.

The sector is involved in discussions about future requirements for servicing EVs, including the role of licensing for EV technicians. There is also a focus on recycling and end-of-life management for EV batteries, highlighting the need for new skills and training.

Automotive manufacturing sector

Transitioning from passenger vehicle manufacturing, the industry now thrives on producing caravans, camper trailers, trucks, buses, motor vehicle bodies, trailers and specialised production such as high-tech engineering and component manufacturing, maintaining its relevance in the global market despite the end of large-scale car manufacturing in 2017. In 2022–23, more than 3,000 businesses generated over $14 billion revenue.The sector thrives primarily on producing caravans and camper trailers, which contribute $3 billion, along with trucks, motor vehicle bodies, trailers and buses.

The workforce, currently stable at approximately 41,500 employees, is anticipated to grow to 50,000+ within the next 9 years, driven by demand for specialised manufacturing skills, particularly in areas facing skill shortages such as structural steel, welding, and engineering. The sector is predominantly concentrated in Victoria showing stronger female representation than other automotive sectors, with a significant portion of the workforce holding VET or higher education qualifications.

Significant growth is seen in innovative areas such as EV technology, with companies like Zero Automotive and Exro Technologies leading in EV conversions, indicating a shift towards more sustainable manufacturing practices and a potential increased local manufacturing of EV components. This evolution underscores the sector's ongoing adaptation and the critical role of vocational training to meet emerging technological demands.

Automotive industry trends and priorities

The automotive industry in Australia is grappling with poor public perceptions portraying it as dirty and unsophisticated, despite significant technological advancements and a shift towards high-tech roles, particularly in electric and hybrid vehicle technologies. While general satisfaction among automotive apprentices is high, the challenge remains in attracting new entrants, particularly women and under-represented groups. Increasing female and underrepresented group participation, the industry can tap into a broader talent pool, addressing the current skill gaps. Fostering an inclusive environment can lead to diverse perspectives and innovative solutions, further strengthening the industry's capacity to meet its demands.

Efforts are underway to improve diversity and inclusion within the industry, with initiatives like Women in Automotive and programs to increase First Nations participation. These efforts are crucial for filling labour shortages and fostering a more inclusive industry culture.

Skilled migration could help address skills shortages. The industry faces challenges with skilled migration – such as the skill level of the workforce requirements not meeting skilled migration requirements, administrative obstacles, and high costs associated with skill recognition – noting the Government seeks to address some of these issues as part of its Migration Strategy.

Mining and Automotive Skills Alliance

Jobs and Skills Councils
An Australian Government initiative

The Mining and Automotive Skills Alliance (AUSMASA) is a Jobs and Skills Council funded by the Australian Government Department of Employment and Workplace Relations.