The Net Zero Transition: how hard will it be for workers in coal mines to find new jobs?

Research Note
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MANDALA

How hard will it be for workers in Australian coal mines to find new jobs as the global energy transition unfolds?

Why it matters

- The global energy transition will fundamentally change the composition of the Australian economy. This change will be felt sharply in coal mining. Government forecasts predict that Australia's coal exports will fall by 50-80% in volume over the next two decades.[1]
- Workers in some occupations will be able to find new jobs easily within their existing occupation and existing location. But other workers will need to relocate, retrain and reskill to find new work. Understanding these differences will help governments and businesses to better target supports to the individuals and communities that need it most. Critically, it underscores the need for a coordinated and strategic approach.

What we did

- We studied a coal mine in New England as a case study. We used microdata on job advertisements to estimate how long it will take workers to find new jobs if the mine closes based on their occupation and whether they have to relocate within NSW or nationally. We do this through a two-step methodology:
    1. We measure how many workers are employed in the coal mine and break down those workers by occupation and location for the 12 biggest occupations.
    2. We consider a scenario where the mine hypothetically closed seven years ago. We then use microdata on job advertisements to see how long it takes those workers to find new jobs based on their occupation and whether they are required to relocate within NSW or nationally to find a new job.

What we found

- Our analysis assumes no additional policy interventions to support the transition and no active management of the workforce disruption.
- If workers do not relocate, 28% of workers in the 12 biggest occupations find a new job within one year, 35% find a new job within two years, 39% find a new job within three years and 43% find a new job within four years. This means that 57% of workers don't find a new job even after 4 years.
- If workers are willing to relocate to somewhere else within NSW, 52% find a job in one year, 67% in two years, 85% in three years and 100% in four years.
- If workers are willing to relocate to anywhere in Australia, 98% find a job in one year and 100% find a job in two years.
- Across all scenarios, motor mechanics and metal fabricators have the easiest time finding new jobs, followed by truck drivers, fitters, electricians, shotfirers (explosives) and mechanical engineers. Those who struggle the most find new jobs are miners, mine deputies, production managers, mining engineers and drillers.

Sources: (1) NSW Department of Treasury (2021) *The sensitivity of the NSW economic and fiscal outlook to global coal demand*.

Climate risks result in a significant reallocation of capital away from mining and towards services

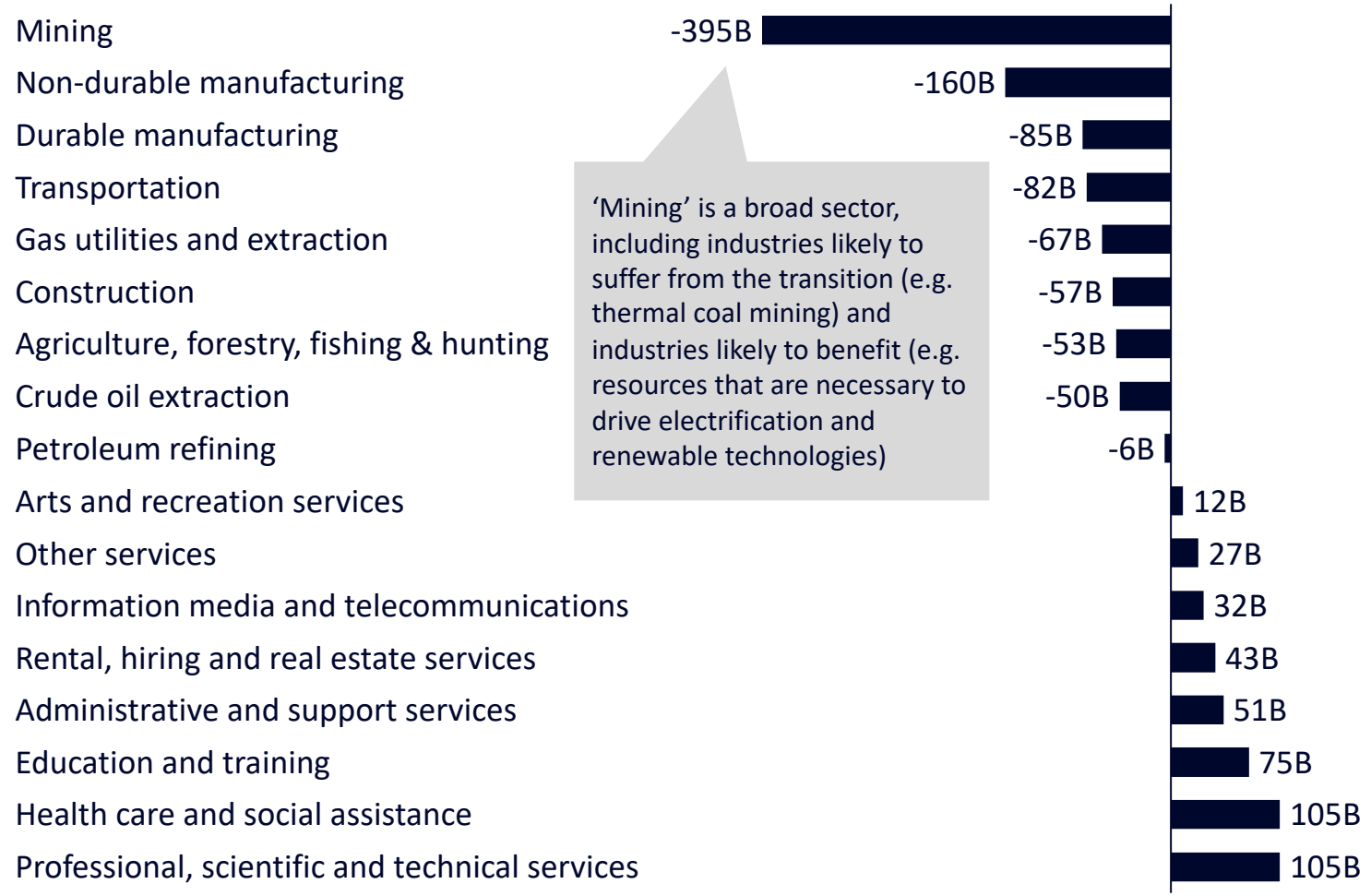
Mandala modelled the implications of APRA's credit rating assessments for the Australian economy using the G-Cubed CGE model.

The results show there is a significant reallocation of capital within the Australian economy under this scenario. The investment reductions were highest in mining and manufacturing between $395B to $245B respectively, reflecting the carbon and capital intensity of the sectors. Crude oil extraction and petroleum found lower reductions despite their carbon intensity. This reflects the relative size of these industries in Australia. The least carbon intensive sector, the services sector, saw a cumulative increase in investment of $450B over 20 years.

This modelling also highlights the harms from delaying Australia's climate transition. If the rate of change was to increase, capital and businesses would be able to adjust to the clean economy in a more orderly way.

Exhibit 1: Changes in Australia's capital stock over 20 years after climate risks priced-in

$AU billions, 2022 dollars



Source: Mandala analysis using the G-Cubed model

Coal mines employ workers from a range of occupations and compete with other industries for those workers

As a sector, coal mining employs 44,600 people. But coal mining as an industry is in structural decline as demand for its product falls domestically and internationally. Government forecasts predict that Australia's coal exports will fall by 50-80% in volume over the next two decades.

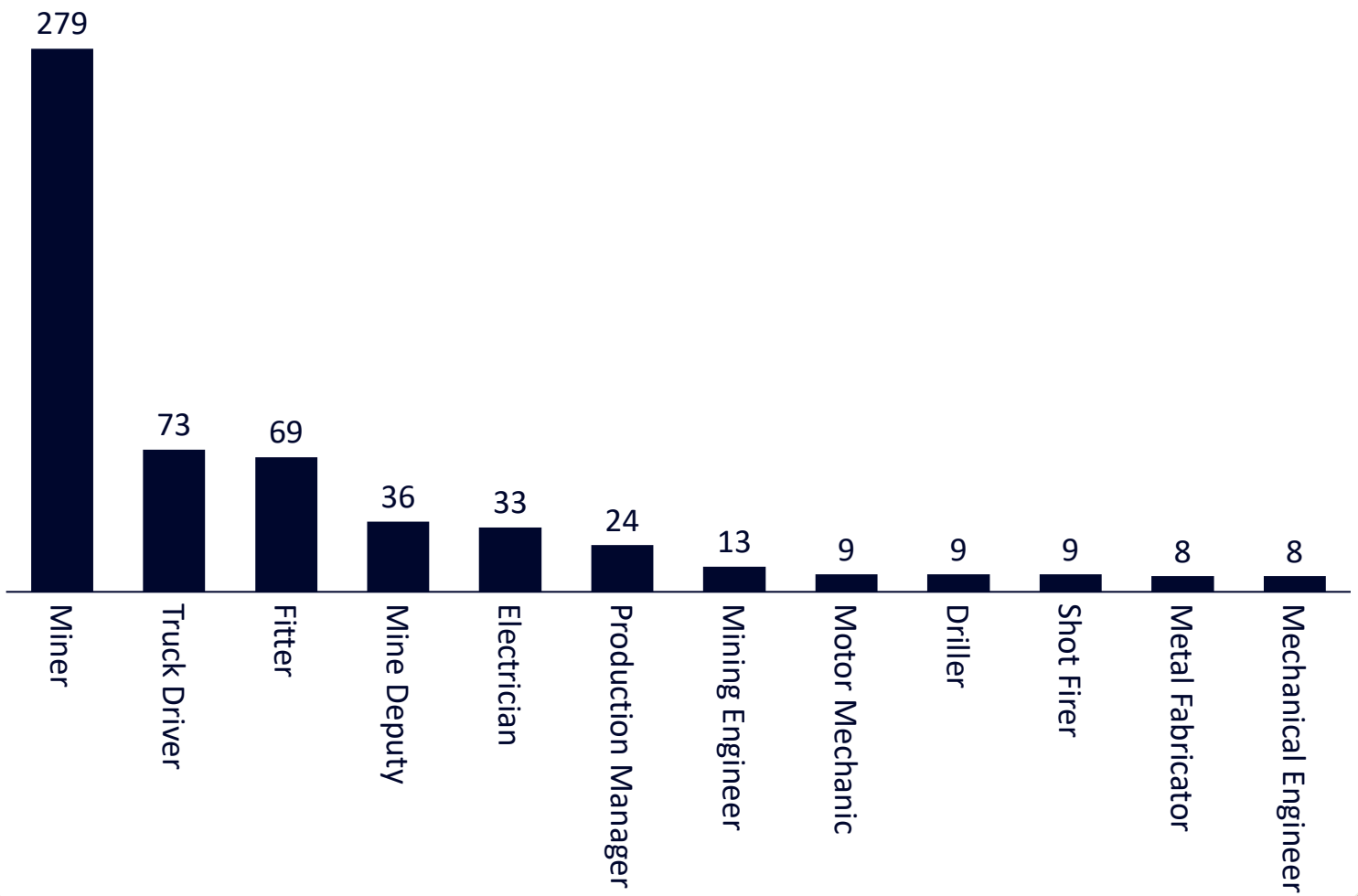
Mandala wanted to understand the impact of this decline on mine workers. To do this, we used microdata on job advertisements to estimate how long it would take workers at a specific coal mine to find new jobs if it closed 5 years ago.

The mine chosen was a coal mine in New England which employs 766 people. The largest professions in the mine were miners, truck drivers and fitters. Most of its workforce lives locally.

Sources NSW Department of Treasury (2021) *The sensitivity of the NSW economic and fiscal outlook to global coal demand.*

Exhibit 2: Coal mine workers at a mine in New England

Headcount by top 12 occupations in the mine, 2023

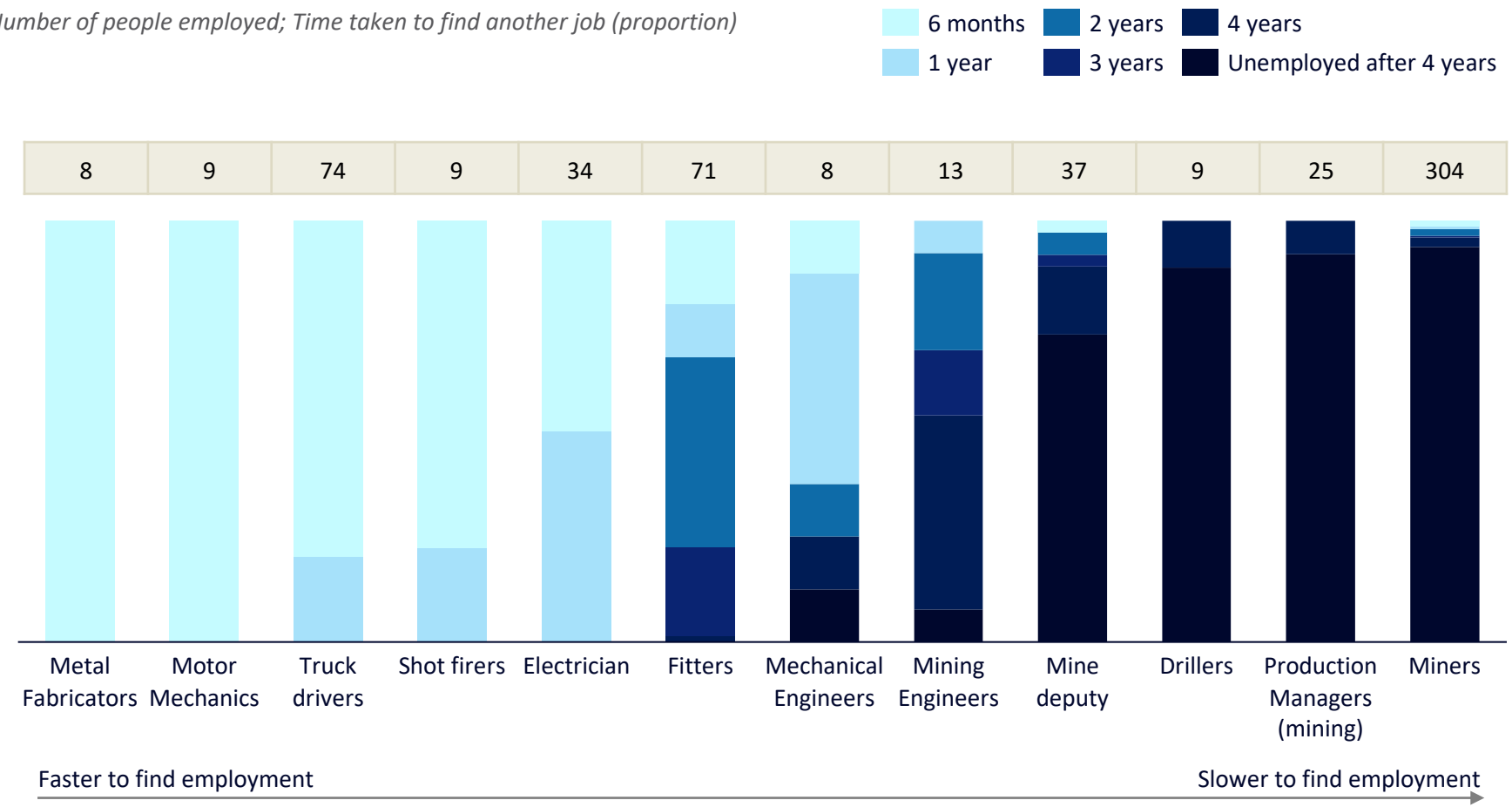


Sources: Mandala analysis

If this coal mine was to close and workers did not relocate, 28% of people would find another job within their region in the first year

Exhibit 3: Time required to find another job outside coal mining in the same occupation within New England and the North West

Number of people employed; Time taken to find another job (proportion)



Occupations that are specific to mining will suffer more in the transition

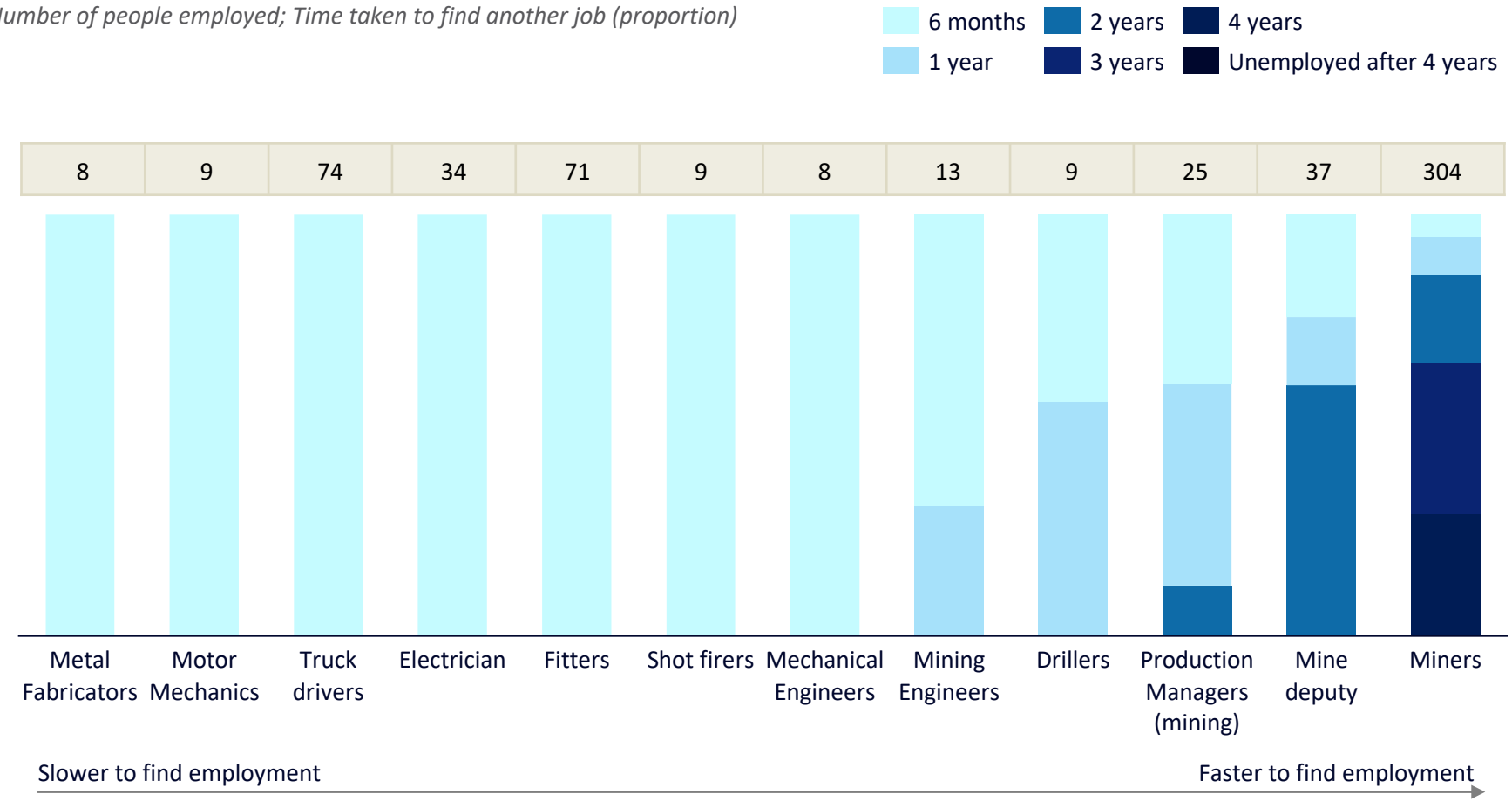
- If workers do not relocate, 28% of workers find a new job within one year, 35% find a new job within two years, 39% find a new job within three years and 43% find a new job within four years.
- Mandala found that metal fabricators, mechanics and truck drivers returned to work the fastest.
- Occupations that are specific to mining took longer to find new jobs.
- Strong employment in the agriculture and construction sectors in the region explains the difference in outcomes for occupations with transferable skills.
- Mandala found that if workers don't leave the region, 71% of workers would be considered long-term unemployed (unemployed for more than a year). Workers that are long-term unemployed are less likely to find a jobs and their employment chances are hurt for years after.

Source: Lightcast; Mandala analysis.

If this coal mine was to close and workers were willing and able to relocate within NSW, 52% of people would find a job within a year

Exhibit 4: Time required to find another job outside coal mining in the same occupation within NSW

Number of people employed; Time taken to find another job (proportion)



Employees with skills in other industries like construction will be forced to move to find work quickly

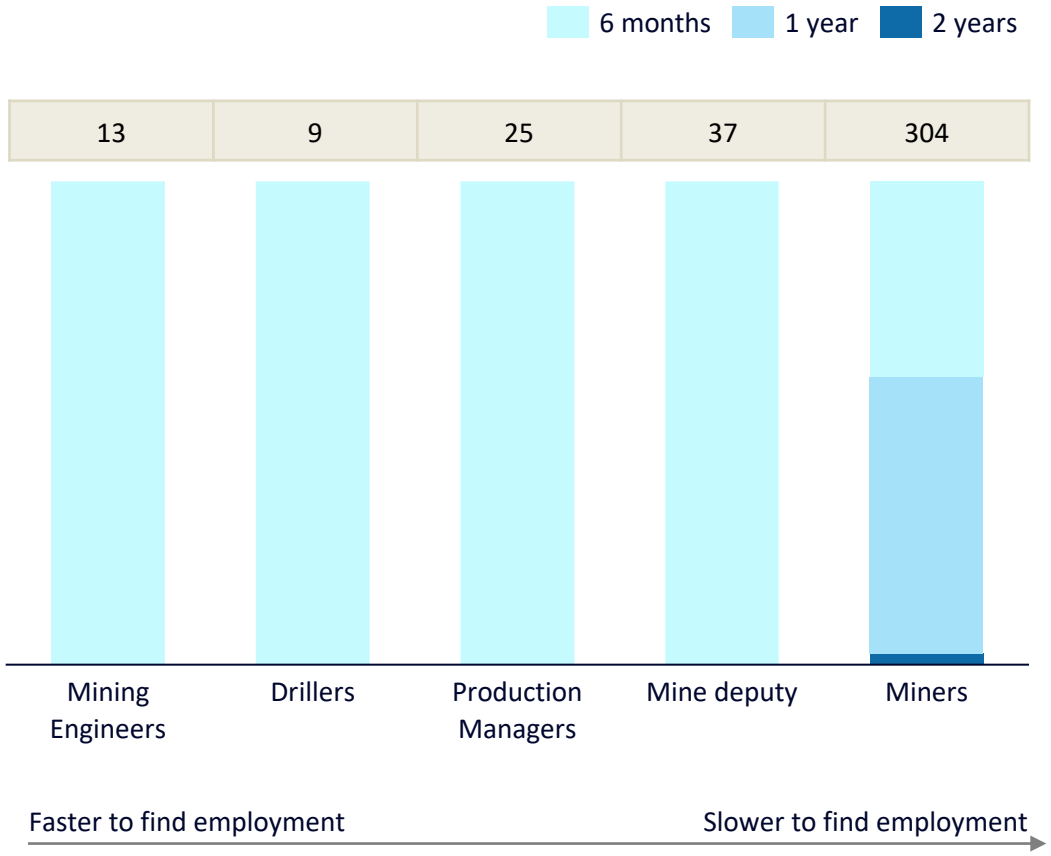
- If workers are willing to relocate to somewhere else within NSW, 52% find a job in one year, 67% in two years, 85% in three years and 100% in four years.
- When workers moved within NSW, Mandala found metal fabricators, mechanics, and electricians returned to work the fastest.
- Lower skilled occupations that are specific to mining still took the longest to find new jobs, with miners taking the longest.
- However, skilled occupations like drillers and mining engineers fared better due to the high demand for their skills within the industry.
- Occupations that benefited most from moving were skilled and in demand in relatively small industries in New England, e.g., fitters and mechanical engineers who are required in manufacturing.

Source: Lightcast; Mandala analysis.

If this coal mine was to close and workers were willing and able to relocate anywhere in Australia, 98% of people would find a job within a year

Exhibit 5: Time required to find another job outside coal mining in the same occupation within Australia

Number of people employed; Time taken to find another job (proportion)



Labour mobility, transferable skills and targeting are critical in easing the transition risk

- If workers are willing to relocate to anywhere in Australia, 98% find a job in one year and 100% find a job in two years.
- These results mean three things for governments:
    1. For workers in any occupation who would like to and are able to move, supporting labour mobility is a critical part of what government can do to ease the transition into new work. These supports could include incentives to move, changes to stamp duty taxes that disincentivise selling property, etc.
    2. For workers who are unable or would not like to move, transferable skills that are in demand in other industries in the region are key to returning to work. For workers that do not have these skills, these can be provided through localised retraining programs.
    3. The transition will be most acutely felt by workers in occupations that are specialised in those industries most impacted by the transition, i.e. miners in coal mining. This means that governments should target their transition support towards these workers and provide the most support to workers with the lowest ability to find new work. This is opposed to providing broad-based support for all displaced workers.

Source: Lightcast; Mandala analysis.

Efforts to ease the net zero transition should focus on occupations that will struggle the most to gain employment

Mandala has developed a transition risk framework to help government prioritise support for workers in occupations that will struggle the most to find new jobs. This framework develops three categories for workers based on occupations:

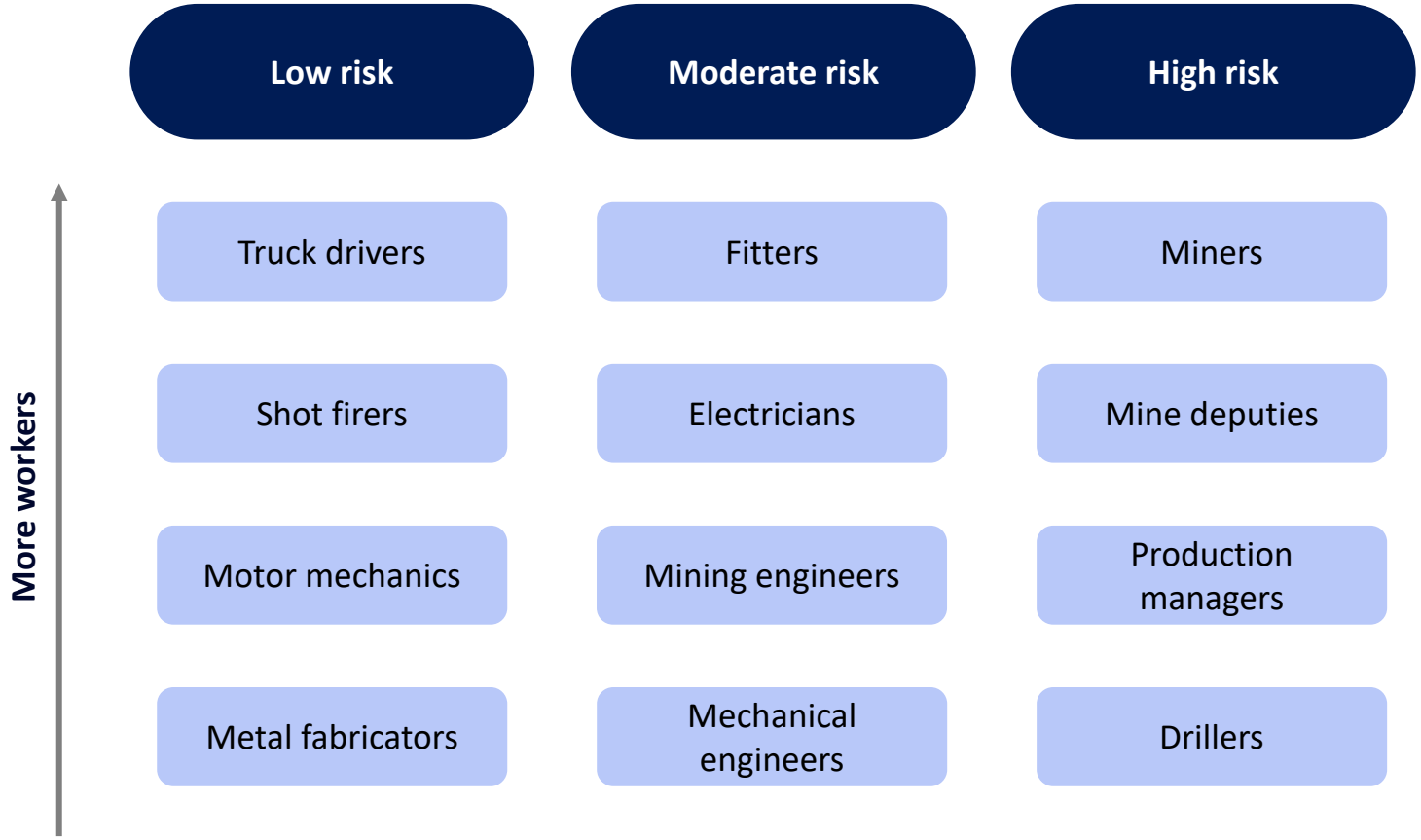
Low risk: These are occupations where the majority of workers gain employment in the **region** they live within six months.

Moderate risk: These are occupations where the majority of workers gain employment in the **state** they are in, within six months.

High risk: These are the occupations where workers must move outside their state to gain employment.

This analysis suggests that efforts to ease the net zero transition should focus on: mining engineers, mine deputies, miners, production managers and drillers.

Exhibit 6: Framework for the transition risk of occupations



Sources: Mandala analysis

Mandala assessed global best practices to identify how transitions are being managed

	Key Policies	"Best practice" in Australia and internationally
Co-creation & planning	**Strategic support**	▪ **Transition strategies:** Government / business / community alignment on actions and resourcing to capture opportunities[1] ▪ **Planning:** Long-term implementation and pre-closure planning of the transition with clear timelines[1]
	Empowered community	▪ **Dialogue and consultation:** Adopt a stakeholder consultation partnership all stakeholder and be responsive to stakeholder expectations ▪ **Inclusive decision making:** Participatory decision making across business and community to empower and share ownership
Community & economic development	**Education investment**	▪ **Regional skills plan:** Co-ordinated government plan for individuals, educators and companies to build relevant skills in high growth sectors / geographies[2] ▪ **Education / retraining fund:** Support for individuals, companies, or education institutions to develop relevant skills for current and future generations
	Investments in future industries	▪ **Future industry development:** Building business specialities in future industries, such as AgTech and new energy technologies[3] ▪ **Entrepreneurship ecosystem:** Coordinated funding for sponsored programs, joint industry projects to stimulate investments and scaling of start-ups ▪ **Cluster development:** Government support for industry-led clusters that develop specialisation / comparative advantage[4,5] ▪ **Social services and infrastructure investment:** Building and maintaining services and infrastructure, such as schools, clinics, roads and rail[6]
Tailored supports for vulnerable cohorts	**Tailored, integrated worker supports**	▪ **Redeployment:** For workers with transferable skills, internal redeployment or individualised job search in short-term[2,5,7,8] ▪ **Labour market program:** Designed to help meet the needs of job seekers while looking for and starting employment[4,5] ▪ **Training and linked work experience:** Tailored skills or job readiness training and placements for workers that do not immediately find work[7] ▪ **Provide workforce as much choice as possible:** Provide workers with autonomy to decide what support they want and require ▪ **Income supports and incentives:** Generous and initially income support that encourages workers to participate in job search and / or training[3] ▪ **Health and mental health support:** Health and wellbeing services for workers and families through providers and community-based facilities[9]
	Support for local businesses	▪ **Local businesses:** Support and enhance local businesses by sharing information, resources and experience[10] ▪ **Supply chain and contractors:** Mitigate the impacts with long lead times which allow for diversification of businesses[9]

SOURCE: (1) Brookings (2017), 'Capturing the next economy: Pittsburgh's rise as a global innovation city'; (2) Trebilcock & Wong (2008) "Trade, Technology, and Transitions: Trampolines or Safety Nets for Displaced Workers?"; (3) Botta (2018), A review of "Transition Management" strategies: Lessons for advancing the green low-carbon transition; (4) AlphaBeta, NERA, METS Ignited (2019), "Staying ahead of the game"; (5) Wiseman, Campbell & Green (2017), 'Prospects for a "just transition" away from coal-fired power generation in Australia: Learning from the closure of the Hazelwood Power Station'; (6) Owen, J. and D. Kemp (2018) Mine closure and social performance: an industry discussion paper. (7) Tilleard (2016), "Growth and resilience of Australian cities 1971-2011"; (8) Borland (2014), "Dealing with unemployment: what should be the role of labour market programs; (9) Acil Allen (2019), The transition of the Australian car manufacturing sector; (10) Everingham (2017) inquiry into how the mining sector can support businesses in regional economies