



# Economic contribution of Glencore in Australia 2022

# Disclaimer

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#### Notes:

- All photos in this document have been provided by Glencore and are subject to Copyright.
- Totals in report may not add due to rounding



# Executive Summary

Glencore is one of Australia's most diversified mining companies, operating in Australia for over 25 years.<sup>1</sup>

Today, Glencore has mines across four Australian states and territories, producing coal, copper, zinc, lead, nickel, cobalt and silver. Glencore engaged with suppliers located in 346 local government areas (LGAs), representing 64% of all LGAs in Australia.

## Glencore's direct impact in 2022

### Total spend

**\$20<sup>bn</sup>**

**\$10.4<sup>bn</sup>**  
on suppliers

**\$2.1<sup>bn</sup>**  
on wages

**\$7.5<sup>bn</sup>**  
on taxes and royalties

### Suppliers supported

**7,370**

### Jobs supported

**18,189**  
Total (at year-end)

**12,954**  
Direct employees  
**5,236**  
Contractors

Source: PwC (2023) Analysis of Glencore direct contributions in 2022

<sup>1</sup> Glencore Our History



# Introduction

Glencore is a diversified natural resources company operating in Australia. In this report we identify the economic contribution that Glencore made in Australia in 2022. This includes Glencore's:

- direct contribution to the Australian economy, which represents the economic value from profit, wages and employment produced, as well as the net taxes and royalties paid
- indirect contribution to the Australian economy, which represents the economic value from employment of sub-contractors and demand for goods and services from suppliers down the supply chain.

For the purposes of this study, we use an economic model of Australia to estimate key economic variables for regions across the country, including direct and indirect employment and direct and indirect economic impact (measured as gross-value added (GVA) ). These results form the basis for understanding Glencore's economic contribution in Australia in 2022.

We review Glencore's direct impact on the Australian economy in terms of:

- revenues received
- people employed
- contractors and suppliers engaged
- taxes, royalties, local council payments, and donations paid.

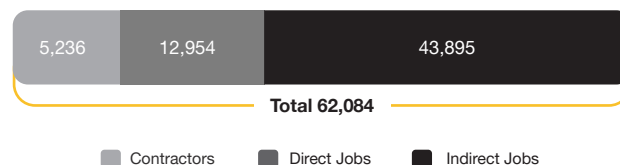
Each of these data points is provided by Glencore along with a corresponding location for the activity. These form key inputs to this analysis. A detailed explanation of our approach and methodology, as well as an explanation of the data used to develop the estimates, is outlined in the Appendix.

## Glencore's economic contribution in Australia

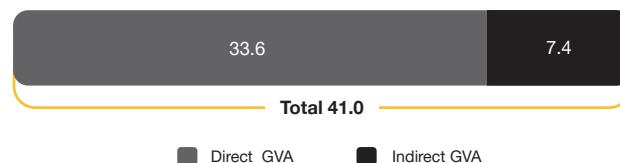
Glencore's spend across suppliers, employment and taxes and royalties have been used to estimate its total economic contribution in the Australian economy in 2022.

Total economic contribution of Glencore in Australia is determined by combining direct and indirect contributions. These values are outlined below for the number of Australian jobs supported by Glencore, and Glencore's contribution to Australian GVA.

Number of Australian jobs supported by Glencore



Glencore's contribution to Australian GVA (\$bn)



In total, Glencore helped to support approximately **62,000 jobs** and contribute **\$41 billion** to the Australian economy in 2022.





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## Glencore's Australian Operations

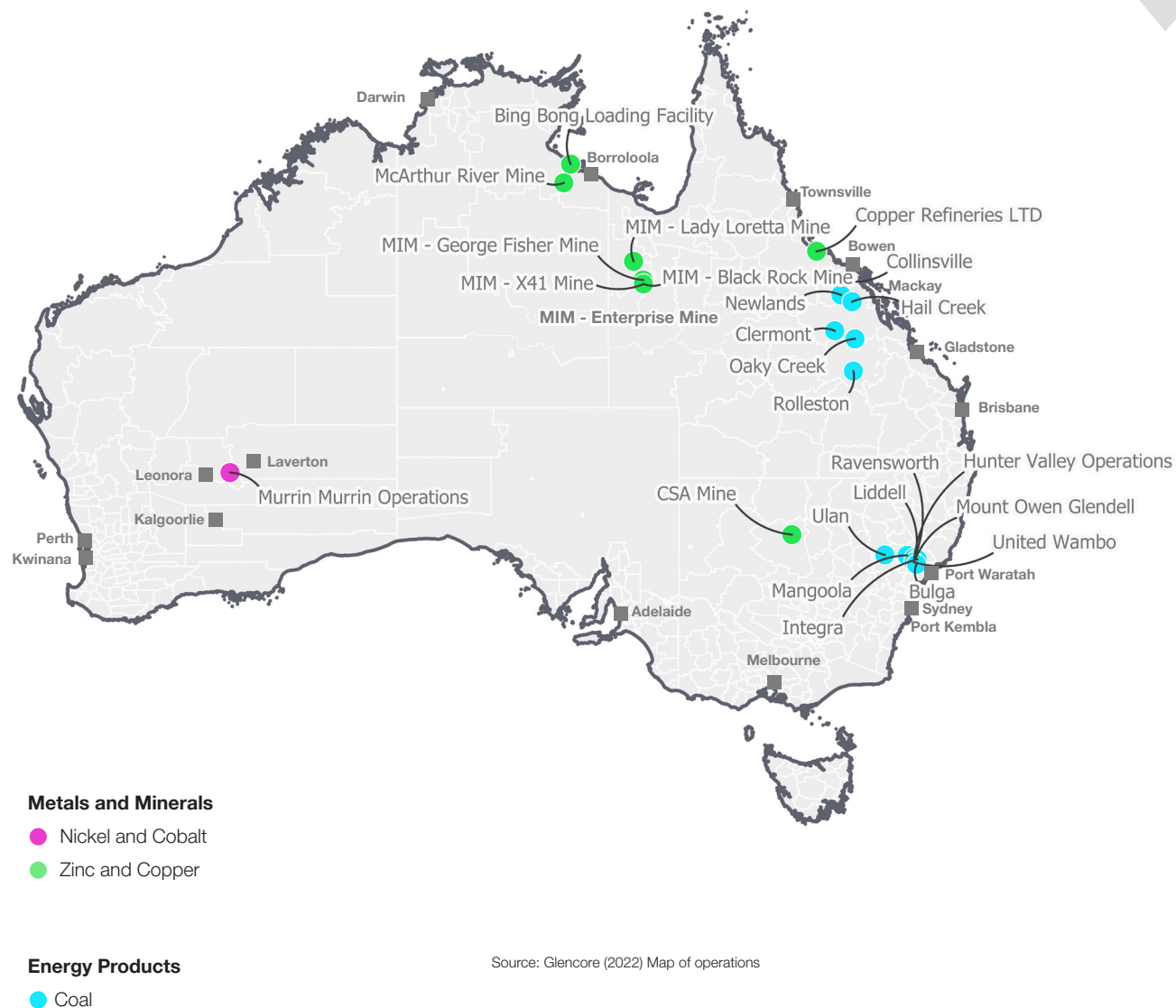
## Glencore's is one of Australia's most diversified mining companies

Glencore is one of Australia's most diversified mining companies, and runs some of Australia's most well-known mining operations, including Mount Isa Mines, which has been operating since 1924.<sup>2</sup>

Today, Glencore operates 25 mines locally, producing coal, copper, zinc, nickel, cobalt, lead and silver. Mines are located in New South Wales, Queensland, Western Australia and the Northern Territory.

Glencore also continues to invest in mineral exploration that could contribute to Australia's future critical mineral exports. This includes copper, zinc, nickel and cobalt.

Location of Glencore's operations



<sup>2</sup> Glencore Our History

Source: Glencore (2022) Map of operations

## Glencore's spend is widely shared across Australia

Glencore operates 25 mines in Australia, producing coal, copper, nickel, cobalt, zinc, lead and silver. The company also operates metals processing operations in Queensland, Western Australia and the Northern Territory.

In 2022, Glencore engaged with 7,370 unique suppliers across all eight states and territories of Australia. Overall, Glencore paid \$10.4 billion for goods and services provided by suppliers located in 346 local government areas (LGAs), representing 64% of all LGAs in Australia.

### Top 10 LGAs by supplier spend (\$m)

Brisbane (QLD)	2,227
Singleton (NSW)	1,046
Mackay (QLD)	939
Mount Isa (QLD)	776
Newcastle (NSW)	634
Cessnock (NSW)	325
Sydney (NSW)	321
Rockhampton (QLD)	215
Melbourne (VIC)	204
Fairfield (NSW)	202

Glencore operates in

4

states and territories

Glencore engages with

7,370

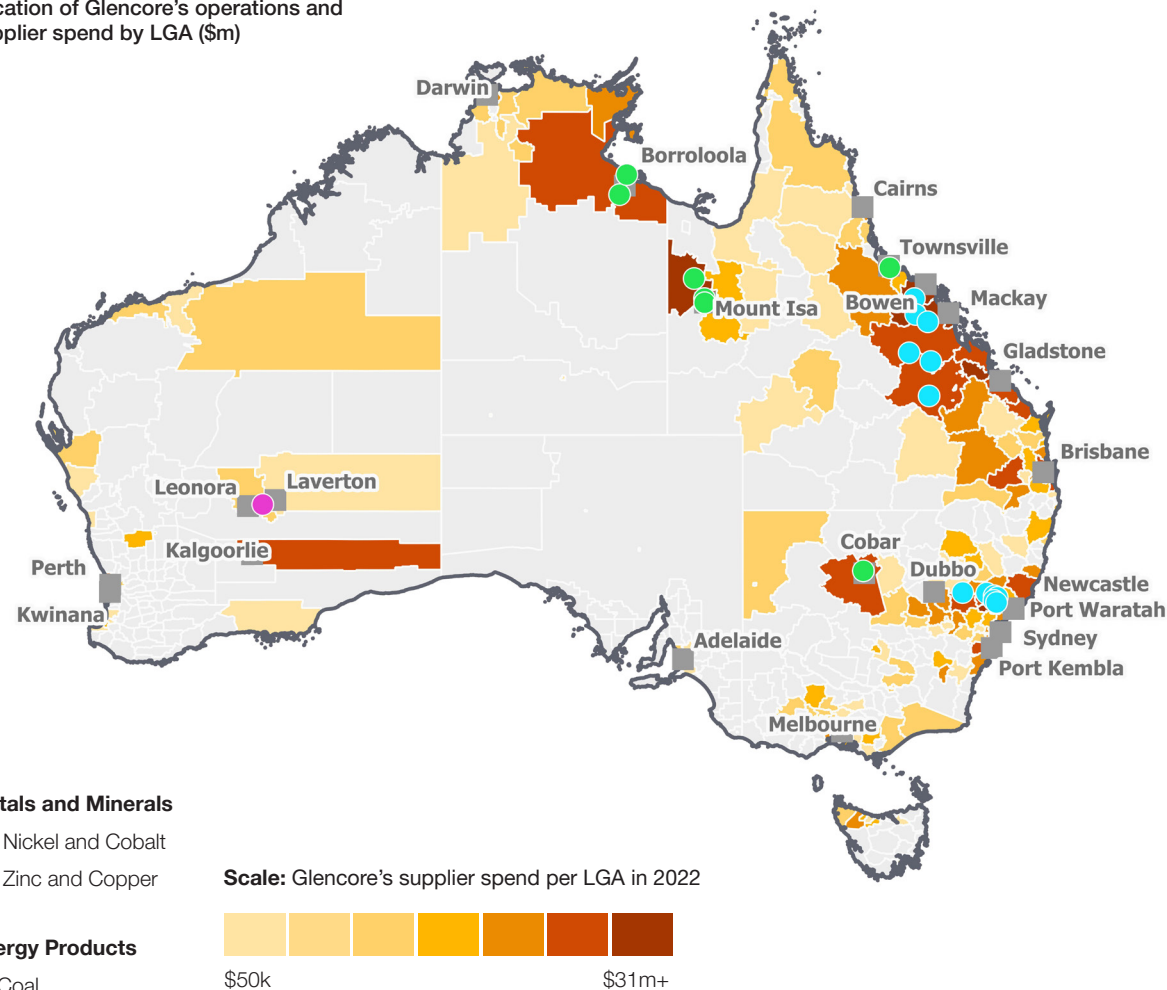
local suppliers

Suppliers are located in

346

LGAs across Australia

Location of Glencore's operations and supplier spend by LGA (\$m)



Source: PwC (2023) Analysis of Glencore supplier spend inputs in 2022

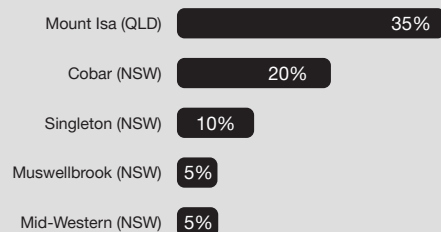
Note: Supplier spend of below \$50k in an LGA is not illustrated on the above map

## Glencore's direct employment footprints extend across Australia

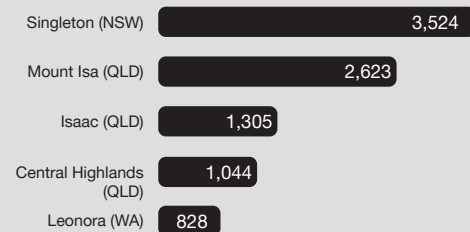
Glencore supported the employment of 18,189 direct employees and contractors (as of 31 December 2022) across all eight Australian states and territories.

Glencore has only two fly-in fly-out (FIFO) sites: Murrin Murrin Operations (WA) and McArthur River Mine (NT). This means that the majority of the company's employees and contractors live near the mine sites, which helps to support and invigorate local communities.

### Top 5 LGAs by direct employee % of workforce



### Top 5 LGAs by number of direct employees



Glencore operates in

# 4

states and territories

Glencore employs or contracts

# 18,189

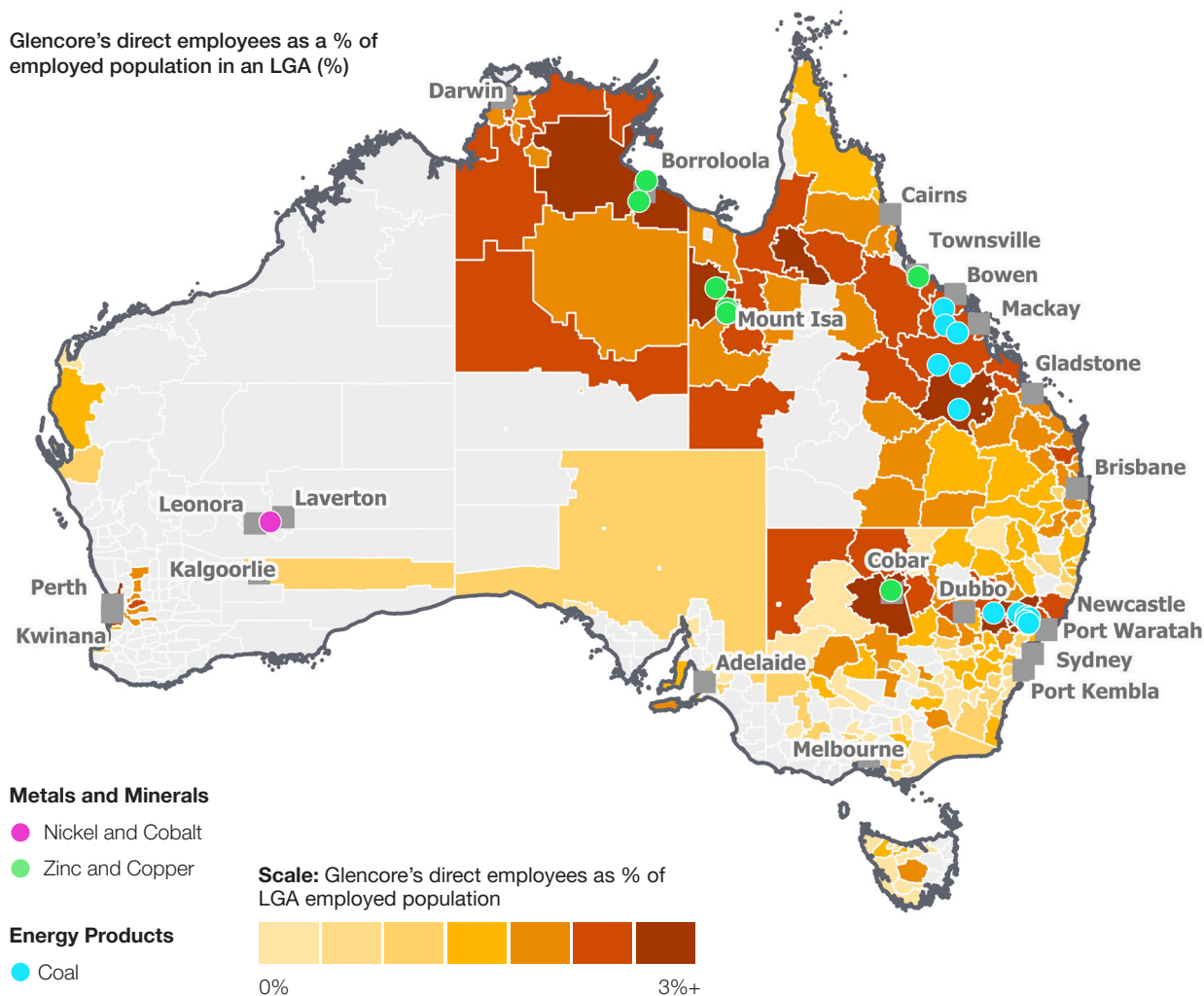
people

Employees are located in

# 313

LGAs across Australia

Glencore's direct employees as a % of employed population in an LGA (%)



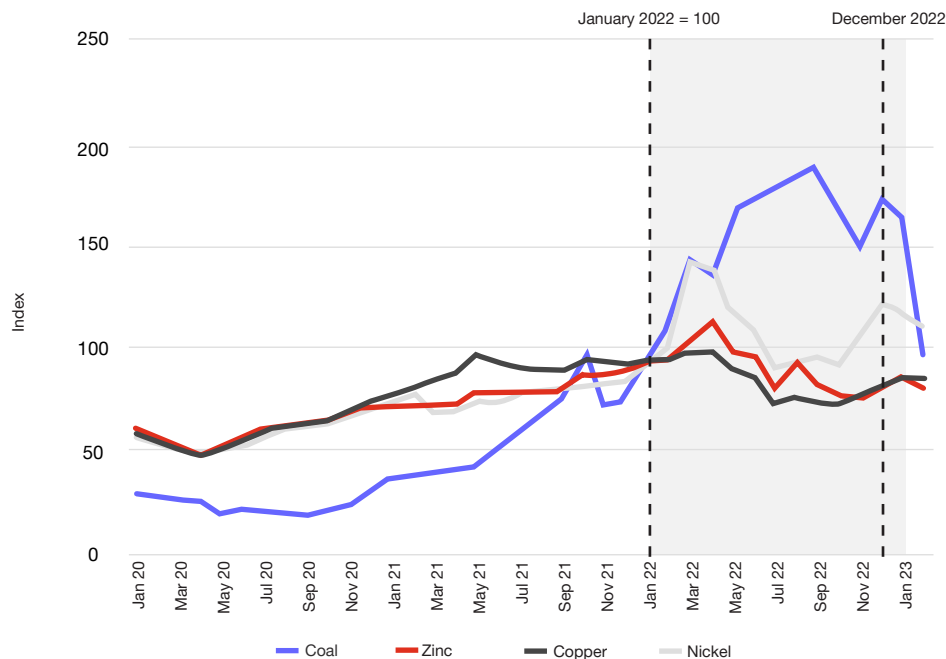
Source: PwC (2023) Analysis of Glencore employee inputs in 2022

## Glencore's place in a volatile global economy

As a major commodity producer, Glencore is particularly susceptible to changes in the global geopolitical landscape. In 2022 Glencore experienced extreme market fluctuations, volatility and dislocations across crude oil, LNG, refined products, coal and logistics infrastructure. Commodity prices responded to years of underinvestment in the development of energy and base metals resources,<sup>4</sup> as well as being impacted by the war in Ukraine.

The chart below outlines the fluctuations in commodity price for Coal, Zinc, Copper and Nickel experienced in the period from January 2020 to January 2023. The following table outlines the major geopolitical challenges that were faced by Glencore in 2022.

### Index of commodity prices



Source: St Louis Fed, Economic Data, Global price of Coal, Zinc, Copper and Nickel

### Event

### How it impacted Glencore

#### Global supply chain crisis

- The COVID-19 pandemic significantly disrupted global supply chains.
- Global energy supply was already constrained by a lack of new mine investment, supply and approvals in recent years.
- This has been further exacerbated by the war in the Ukraine, and is expected to have long-term ramifications.
- Logistical bottlenecks have arisen across the world, pushing up export costs and extending delivery times. This has created a challenging environment for companies to navigate, requiring strategic adjustments to mitigate the impact of the crisis on their operations.<sup>5</sup>

#### War in Ukraine

- Energy prices ramped up globally, with unprecedented sanctions from the EU, USA and other nations,<sup>6</sup> as well as a reduction in fossil fuel and gas flow from Russia
- Coal reached an all-time high of USD 467 / tonne in September 2022, up over 910% from its lowest level in August 2020.<sup>7</sup>

#### Inflationary pressures

- Global and local inflation, driven by the events noted above, has impacted the way Glencore can operate its businesses.
- In Australia, inflation was 10.1% in the 12-months to December 2022 (producer price index for coal mining industry inputs growth).<sup>8</sup>
- The associated tighter monetary policy conditions present risk to the economic outlook in 2023 and beyond.

<sup>4</sup> IEA, The Role of Critical Minerals in Clean Energy Transitions (2021)

<sup>5</sup> JP Morgan, Global Supply Chain Crisis

<sup>6</sup> Brookings Institute, Sanctions on Russia over Ukraine

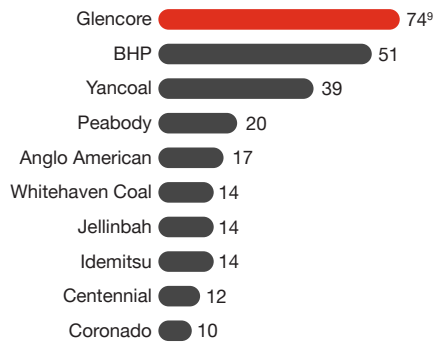
<sup>7</sup> Trading Economics, Coal historical price 2008-2022

<sup>8</sup> Australian Bureau of Statistics, Consumer Price Index, Australia

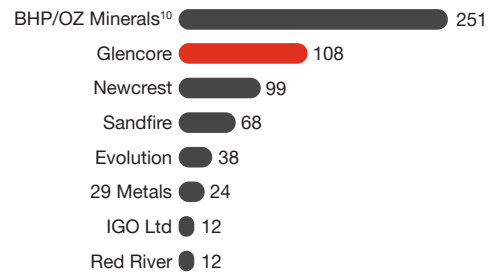
## Australian commodity production by company

Glencore is a key contributor to Australia's minerals production, ranking as either the largest or second-largest producer of coal, copper, cobalt, nickel, zinc, lead and silver in 2022.

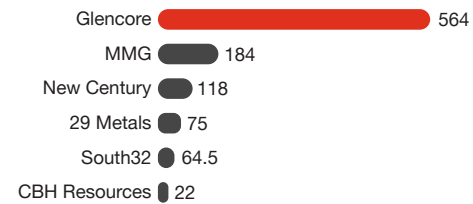
### Coal (million tonnes)



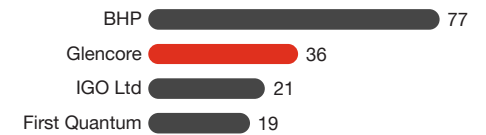
### Copper (kilotonnes)



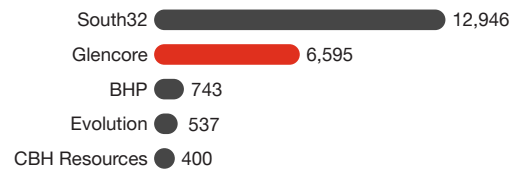
### Zinc (kilotonnes)



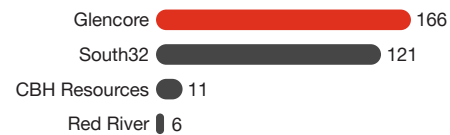
### Nickel (kilotonnes)



### Silver (kilo ounces)



### Lead (kilotonnes)



### Cobalt (kilotonnes)

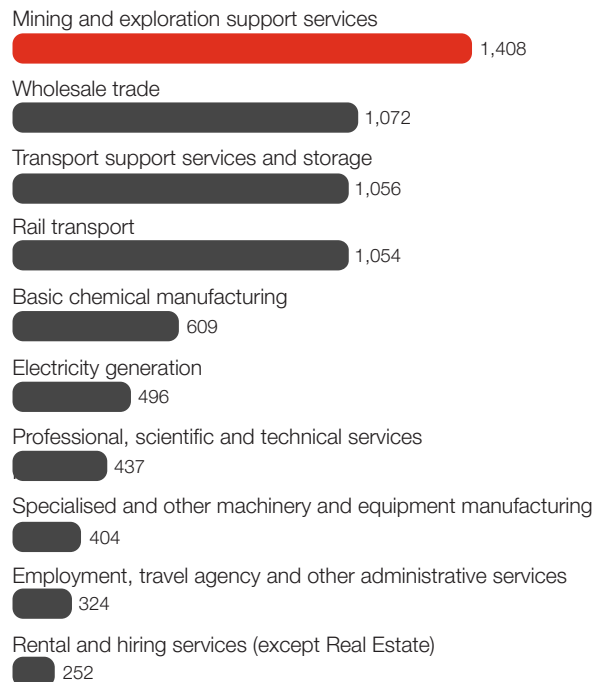


Source: Company reports and publicly available information, 2022.

<sup>9</sup> Glencore's share of its managed saleable production of 95 million tonnes (not including Joint Venture partners' share)  
<sup>10</sup> BHP completed the acquisition of OZ Minerals on 2 May 2023

## Glencore's supplier spend supports a diverse range of sectors

### Top 10 industries of Glencore's Australian supplier spend in 2022 (\$m)



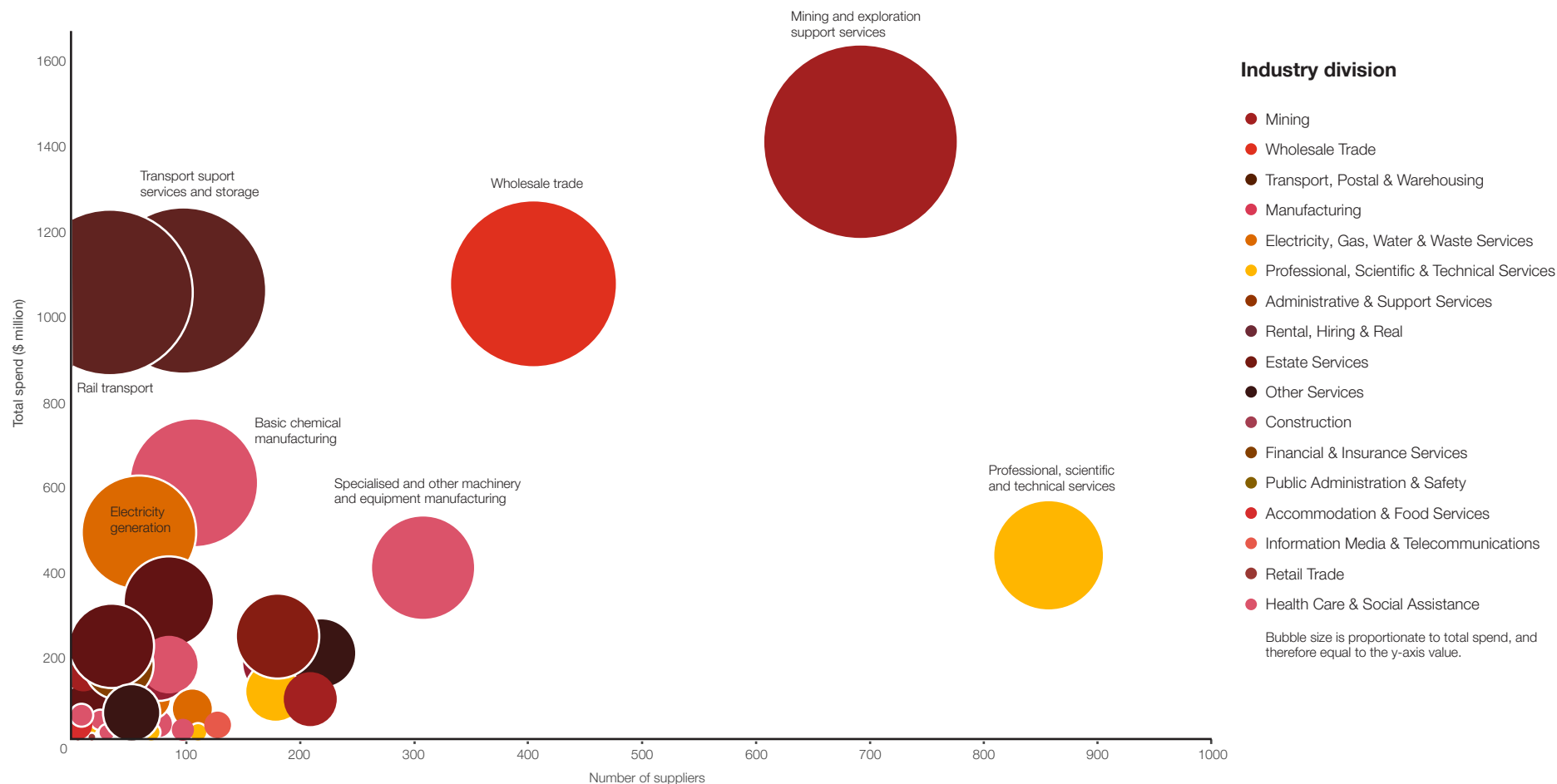
Source: PwC (2023) Analysis of Glencore supplier spend across Australia by industry

Glencore engages with over 7,370 unique suppliers across Australia, and more abroad. Our analysis of the top 20% of suppliers identified suppliers from over 100 industries providing goods and services to Glencore. This highlights the complexity required to develop and operate mine sites across Australia.



## Glencore supports a broad range of industries

Glencore needs the support of suppliers from over 100 different industries. This highlights the importance of the broader Australian economy to the operations of Glencore, and also outlines the broad range of industries that Glencore contributes to through its direct and indirect contributions.

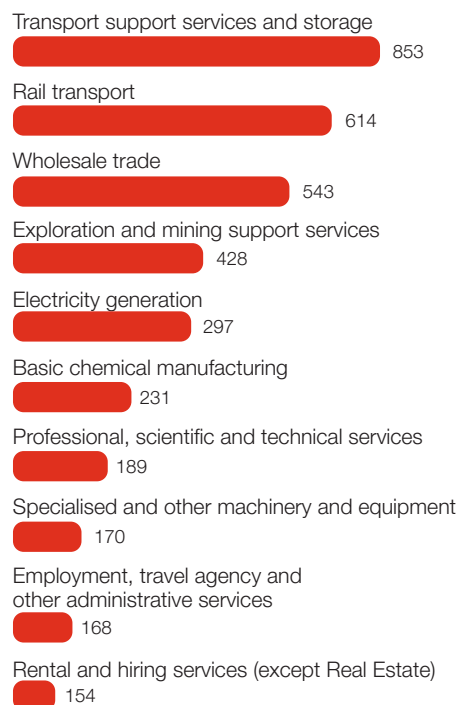


Source: PwC (2023) Analysis of Glencore supplier spend by industry in 2022

Glencore's  
suppliers are spread  
across the nation



### Top 10 supplier spend by sector in Queensland (\$m)

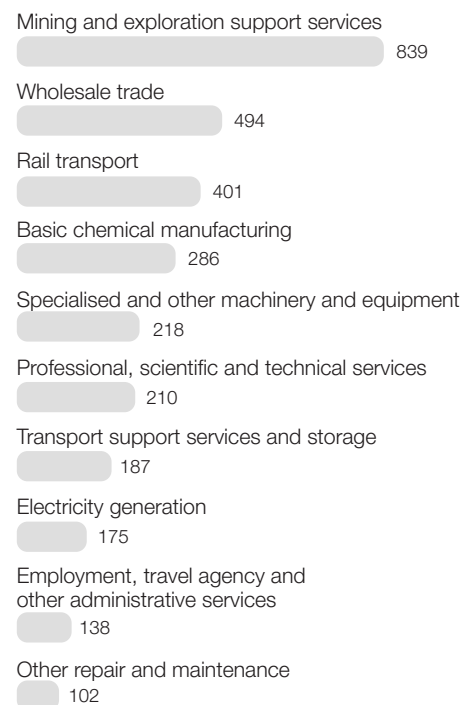


Source: PwC (2023) Analysis of Glencore direct spend data for Queensland in 2022

Note: supplier spend by location is determined by the location of the supplier providing goods or services to Glencore.

**51%**   
of Glencore's total supplier spend  
is in Queensland

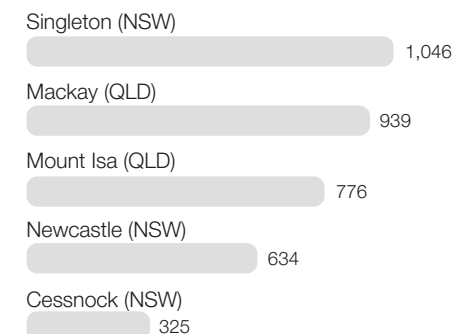
### Top 10 supplier spend by sector in NSW (\$m)



Source: PwC (2023) Analysis of Glencore direct spend data for NSW in 2022

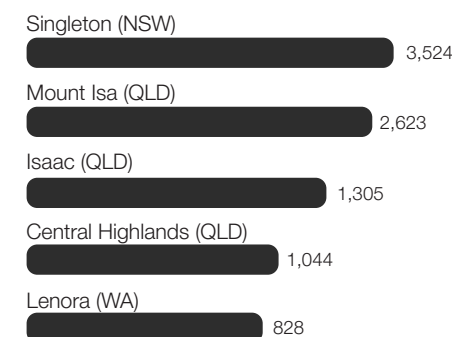
**40%**   
of Glencore's total supplier spend is in  
New South Wales

### Top 5 regional LGAs by supplier spend (\$m)



Source: PwC (2023) Analysis of Glencore direct spend data in 2022

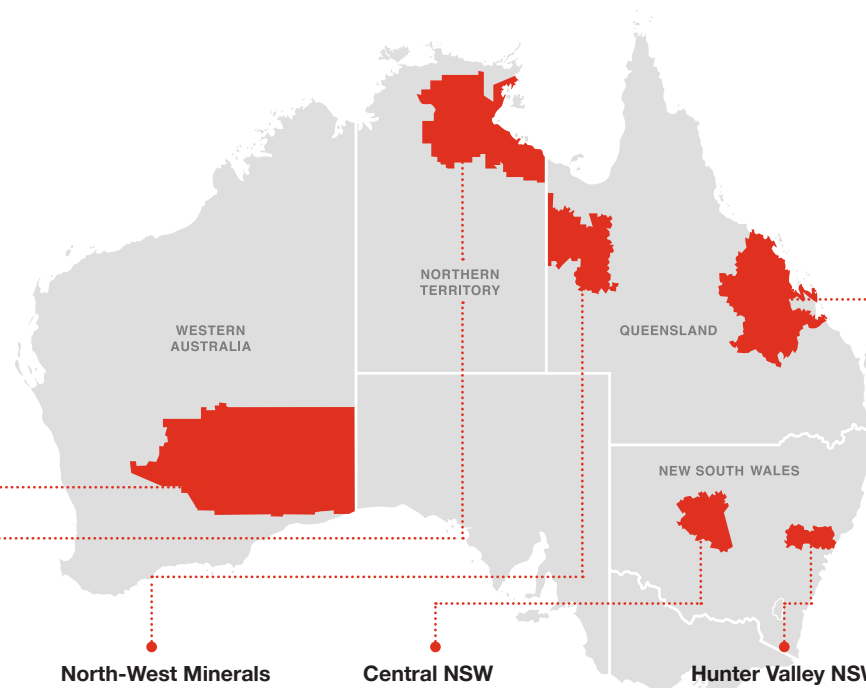
### Top 5 LGAs by direct employment



Source: PwC (2023) Analysis of Glencore employee data in 2022

## Glencore contributes to regions across all of Australia

There are six regions where Glencore operates mines across Australia, covering its commodity businesses of coal, zinc, copper, nickel and cobalt.



### Goldfields WA

**LGAs included:**

Kalgoorlie-Boulder, Laverton, Leonora, Menzies

**Operations:**

Murrin Murrin Mine, Kwinana Port

**Commodities produced:**

Nickel, Cobalt

**Employs:**

828 direct, 339 contractors

**Suppliers in region:**

39

**Total economic contribution (direct + indirect GVA) to region:**

\$29m

### Roper Gulf NT

**LGAs included:**

Roper Gulf, Katherine

**Operations:**

McArthur River Mine, Bing Bong Loading Facility

**Commodities produced:**

Zinc, Lead

**Employs:**

553 direct, 696 contractors

**Suppliers in region:**

37

**Total economic contribution (direct + indirect GVA) to region:**

\$74m

### North-West Minerals Province QLD

**LGAs included:**

Mount Isa, Cloncurry

**Operations:**

Mount Isa Mines, Lady Loretta Mine

**Commodities produced:**

Zinc, Copper, Lead, Silver

**Employs:**

2,623 direct, 1,059 contractors

**Suppliers in region:**

328

**Total economic contribution (direct + indirect GVA) to region:**

\$7,131m

### Central NSW

**LGAs included:**

Cobar

**Operations:**

CSA Mine

**Commodities produced:**

Copper

**Employs:**

507 direct

**Suppliers in region:**

91

**Total economic contribution (direct + indirect GVA) to region:**

\$693m

### Hunter Valley NSW

**LGAs included:**

Singleton, Cessnock, Muswellbrook, Mid-Western

**Operations:**

Mangoola, Ulan West, Ulan Underground, Hunter Valley Operations, Liddell, Mount Owen, Ravensworth, Integra, United Wambo, Bulga, Glendell

**Commodities produced:**

Coal

**Employs:**

4,458 direct, 1,676 contractors

**Suppliers in region:**

740

**Total economic contribution (direct + indirect GVA) to region:**

\$7,520m

### Bowen Basin QLD

**LGAs included:**

Isaac, Whitsunday, Rockhampton, Central Highlands

**Operations:**

Collinsville, Newlands, Hail Creek, Clermont, Oaky Creek, Rolleston

**Commodities produced:**

Coal

**Employs:**

2,912 direct, 1,250 contractors

**Suppliers in region:**

587

**Total economic contribution (direct + indirect GVA) to region:**

\$3,269m

Notes:  
Employee and contractor numbers capture the employment at sites within the region.  
Suppliers in region describes number of suppliers who are based in the LGA.

Source: PwC (2023) Analysis of Glencore's economic contribution in 2022

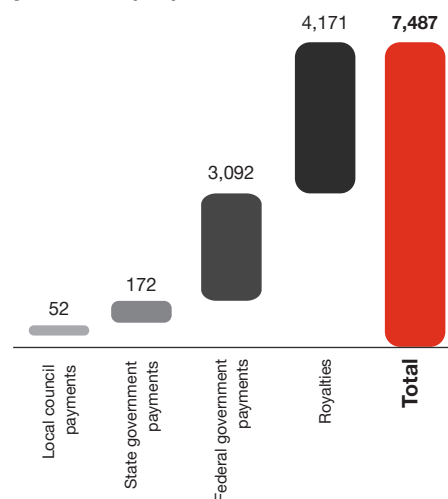
## In 2022, Glencore operations paid \$7.3 billion in taxes and royalties in Australia

In 2022, Glencore paid \$7.3 billion in taxes and royalties, which was an increase of 270% from 2021.

Glencore's tax and royalty bill is equivalent to:

- Just over half (53%) of Australia's annual Defence personnel budget (\$14b)<sup>11</sup>
- All of the Australian Government's Plan for Cheaper Child Care (\$4.7b) and the Fixing the Aged Care Crisis (\$2.5b)<sup>12</sup>
- Nearly two-thirds (63%) of the NSW Government's Commitment to Health Infrastructure (\$11.9b),<sup>13</sup> or just more than three-quarters (77%) of the Queensland Government's Health and Hospital Plan (\$9.8b),<sup>14</sup> both 4-year initiatives.

### Taxes and royalties paid for calendar year 2022 (\$m)



Source: PwC (2023) Analysis of Glencore tax and royalty data in 2022



Note: Tax data sourced from Glencore includes 100% of all Glencore managed operations and 100% of the Hunter Valley Operations joint venture of which Glencore is a 49% participant, with the exception of federal income tax where the data includes Glencore payments only.

<sup>11</sup> [ASPI Australian Defence Working Budget 2022-23](#)

<sup>12</sup> [Australian Government, Budget 2022-23](#)

<sup>13</sup> [NSW Government, Health Infrastructure](#)

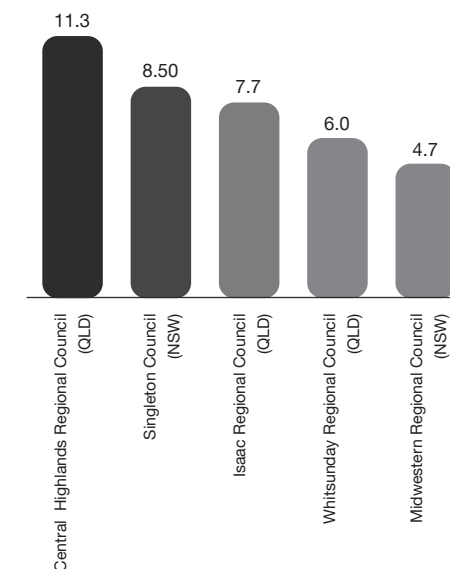
<sup>14</sup> [Corrs Chambers Westgarth, 2022](#)

## Local council payments

Glencore paid \$51.8 million to 25 local councils in 2022.<sup>14</sup>

Payments were made to 25 local councils, largely driven by rates for Glencore's operations across Australia.

### Top 5 payments to local council for calendar year 2022 (\$m)

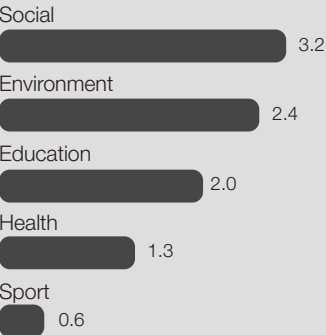


Source: PwC (2023) Analysis of Glencore local council spend data in 2022

## Glencore supports local communities across Australia

Glencore supports local communities via a combination of partnerships, sponsorships, funding and voluntary employee contributions. In 2022, Glencore contributed \$10.3 million in community payments, which was an increase of \$2.3m from 2021.<sup>15</sup>

### Community partner spend by category in 2022 (\$m)



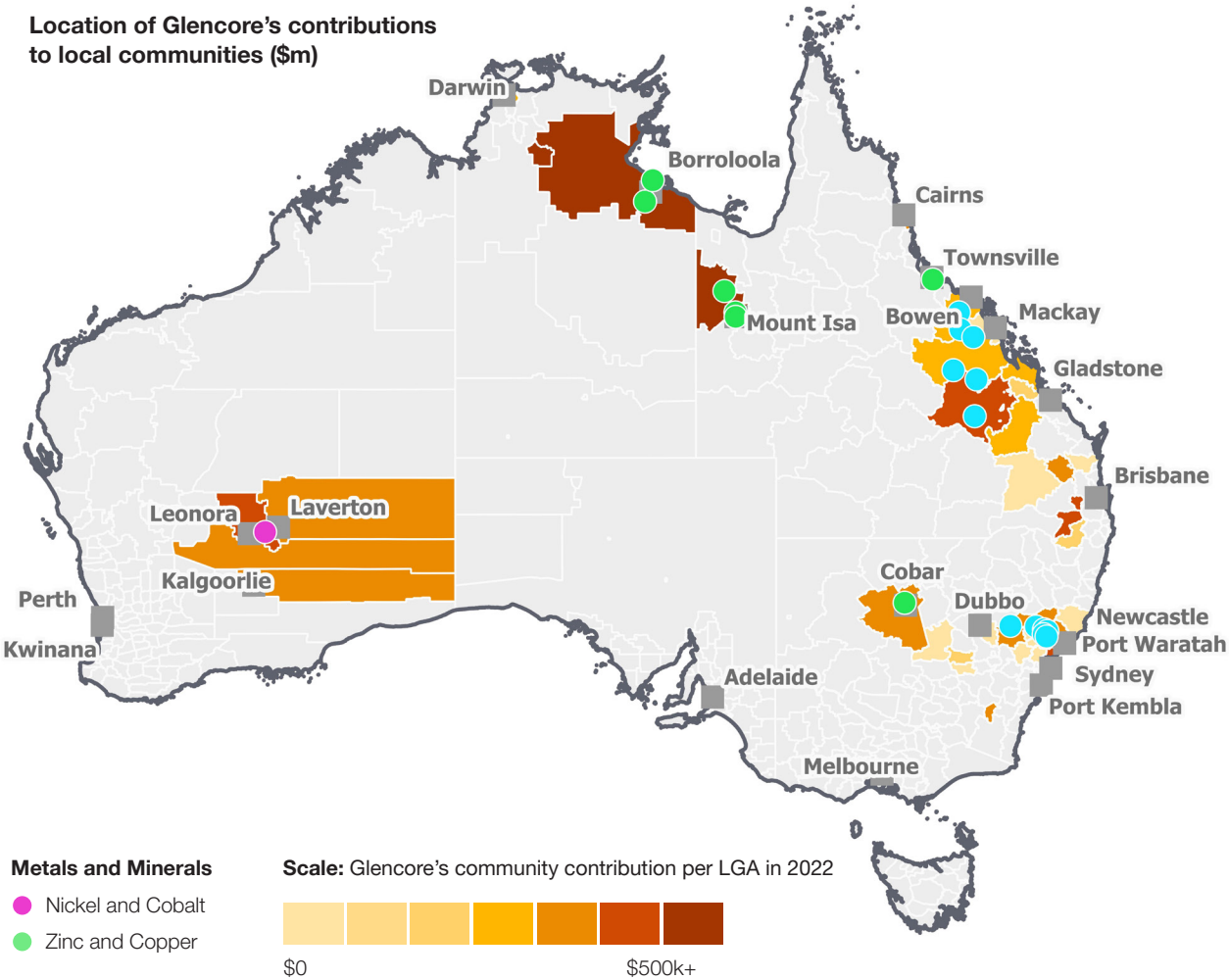
Source: PwC (2023) Analysis of Glencore community contribution data in 2022

### Glencore contributed most to the following initiatives in 2022

- 1 \$1.4m to the McArthur River Mine Community Benefits Trust
- 2 \$1.2m to the Northern Hairy-Nosed Wombat Project, in partnership with the Queensland Department of Environment and Heritage Protection
- 3 \$1.0m to the NSW Disaster Flood Relief Program

<sup>15</sup> PwC analysis of Glencore community spend data (2022)

### Location of Glencore’s contributions to local communities (\$m)



Source: PwC (2023) Analysis of Glencore community spend inputs in 2022



# Glencore's Commodity Business Units

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As of 2022, Glencore has 25 mines operating in Australia, producing coal, copper, zinc, nickel, cobalt, lead, and silver. These mines are situated in various locations across the country, including New South Wales, Queensland, Western Australia, and the Northern Territory.

Operations are viewed under three key banners that encapsulate the broader Glencore ecosystem. These are:

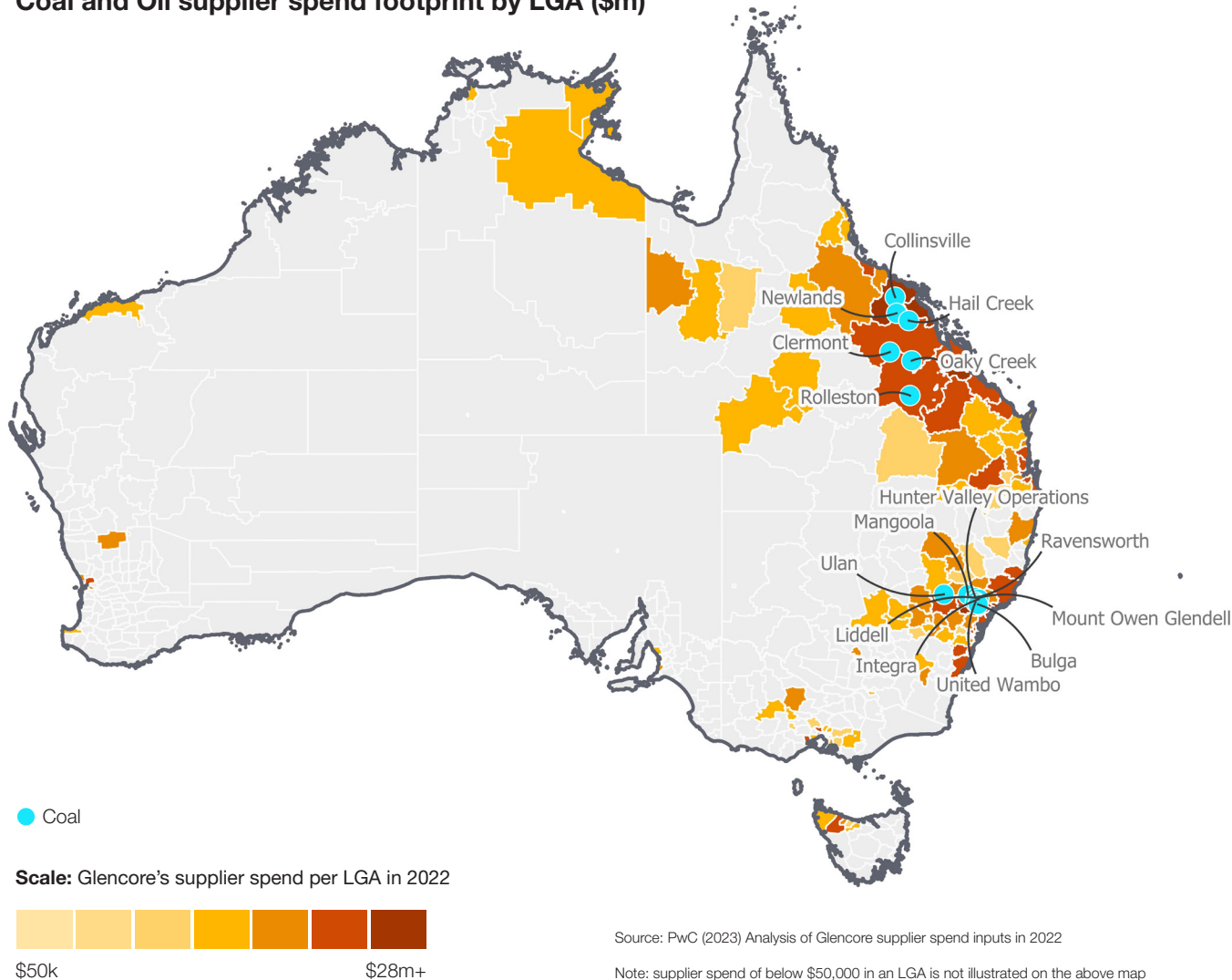
- 1 Coal and Oil
- 2 Zinc and Copper
- 3 Nickel and Cobalt

The three operation groupings are explored in additional detail on the following pages. Key information on direct contributions from Glencore and broader economic impacts for each operation grouping are outlined.

The spend and contribution by Glencore's other operations, including the Aurukun Bauxite Project, Glencore Marketing, and the Glencore corporate function are not included in the summaries on following pages.

## Coal and Oil

### Coal and Oil supplier spend footprint by LGA (\$m)



Coal and Oil economic contribution  
(employment and direct + indirect GVA) to the Australian economy in 2022

**42,532** | **\$24.3 billion**  
employment supported | value added

Produced  
**95 million tonnes**  
of coal

Taxes and royalties  
**\$7.0 billion**

Directly employs  
**7,548**  
people

Paid  
**\$1.2 billion**  
in wages

Spent  
**\$7.3 billion**  
on suppliers

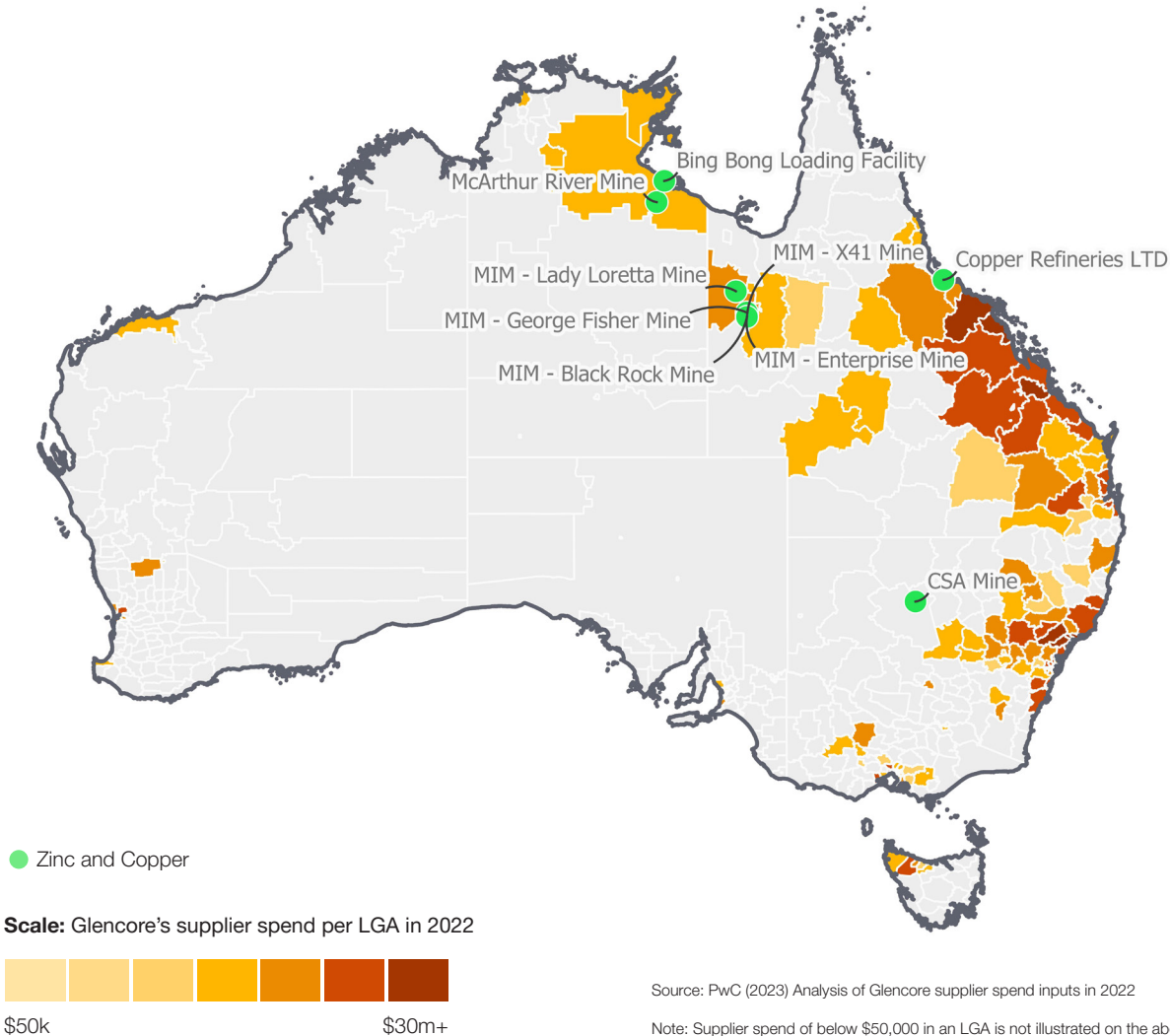
Directly contracts  
**2,932**  
people

- Glencore supported the employment of 10,480 people in its coal mining operations (including direct employees and contractors)
- In NSW, Glencore produced 54 million tonnes of coal across 11 operations. Most of the coal is exported through the Port of Newcastle.
- In Queensland, Glencore produced 41 million tonnes of coal across 5 operations. Coal was exported through the Wiggins Island, Abbot Point, Dalrymple Bay and RG Tanna coal terminals.

Note: Data from Glencore includes 100% of all Glencore managed operations and 100% of the Hunter Valley Operations joint venture, of which Glencore is a 49% participant.

## Zinc and Copper

### Zinc and Copper supplier spend footprint by LGA (\$m)



Zinc and Copper total economic contribution  
(employment and direct + indirect GVA) to the Australian economy in 2022

**15,055** employment supported | **\$12.3 billion** value added

Produced  
**564 thousand tonnes**  
of zinc

Produced  
**144 thousand tonnes**  
of copper

Taxes and royalties  
**\$293 million**

Directly employs  
**4,267 people**

Paid  
**\$656 million**  
in wages

Spent  
**\$2.4 billion**  
on suppliers

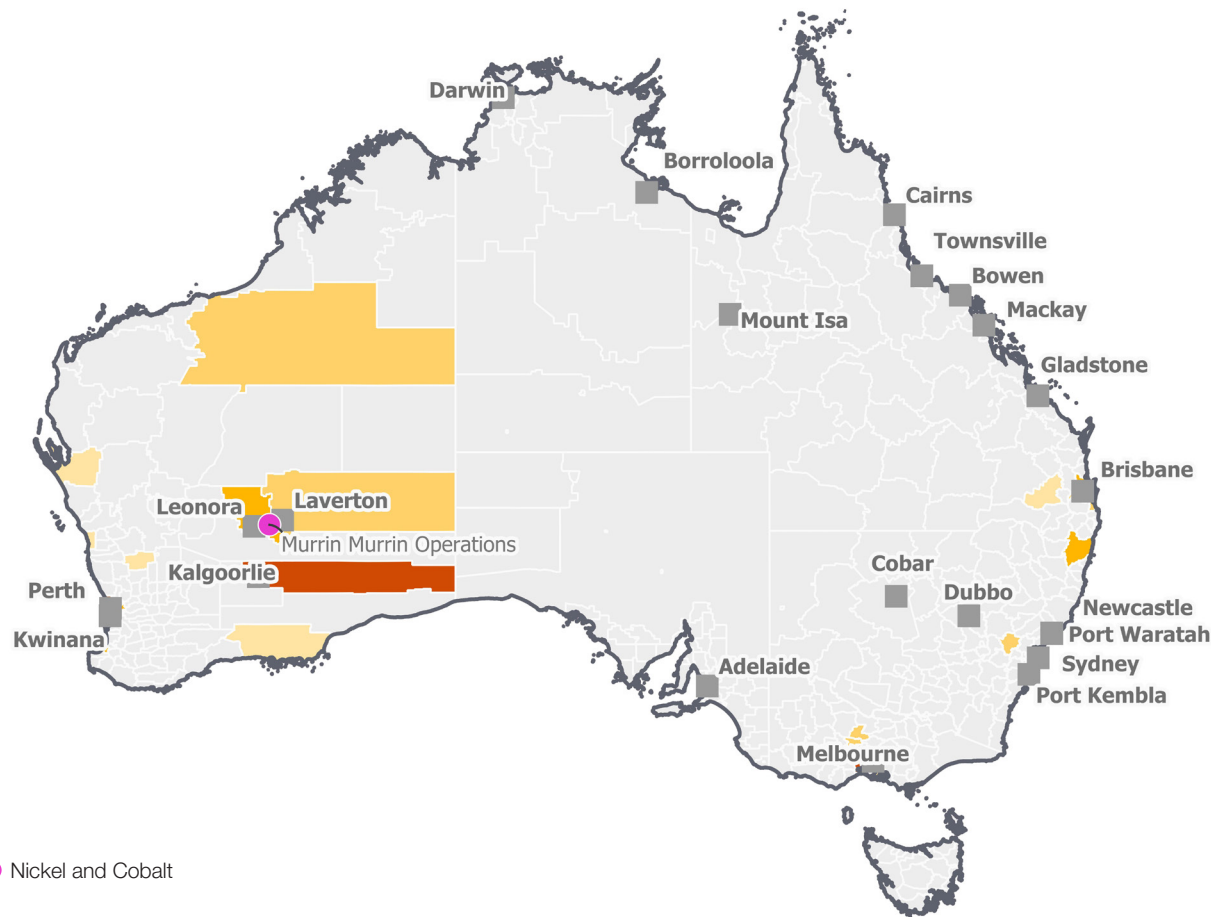
Directly contracts  
**1,943 people**

- Glencore's zinc and copper operations support the employment of 6,209 people (including direct employees and contractors).
- In particular, Glencore supports the employment of 3,683 direct employees and contractors in the Mount Isa LGA, driven by large operations at Mount Isa Mines and Lady Loretta Mine.

Note: On 17 March 2022, Glencore and Metals Acquisition Corporation (MAC), entered into a binding agreement for the sale and purchase of Glencore's CSA copper mine in NSW. The transaction is expected to be completed in mid-2023.

# Nickel and Cobalt

## Nickel and Cobalt supplier spend footprint by LGA (\$m)



● Nickel and Cobalt

**Scale:** Glencore's supplier spend per LGA in 2022



Source: PwC (2023) Analysis of Glencore supplier spend inputs in 2022

Note: Supplier spend of below \$50,000 in an LGA is not illustrated on the above map

Nickel and Cobalt total economic contribution  
(employment and direct + indirect GVA) to the Australian economy in 2022

**3,498**  
employment supported

**\$2.6** billion  
value added

Produced  
**40** thousand  
tonnes  
of nickel

Produced  
**3** thousand  
tonnes  
of cobalt

Taxes and royalties  
**\$151** million

Directly employs  
**828**  
people

Paid  
**\$135** million  
in wages

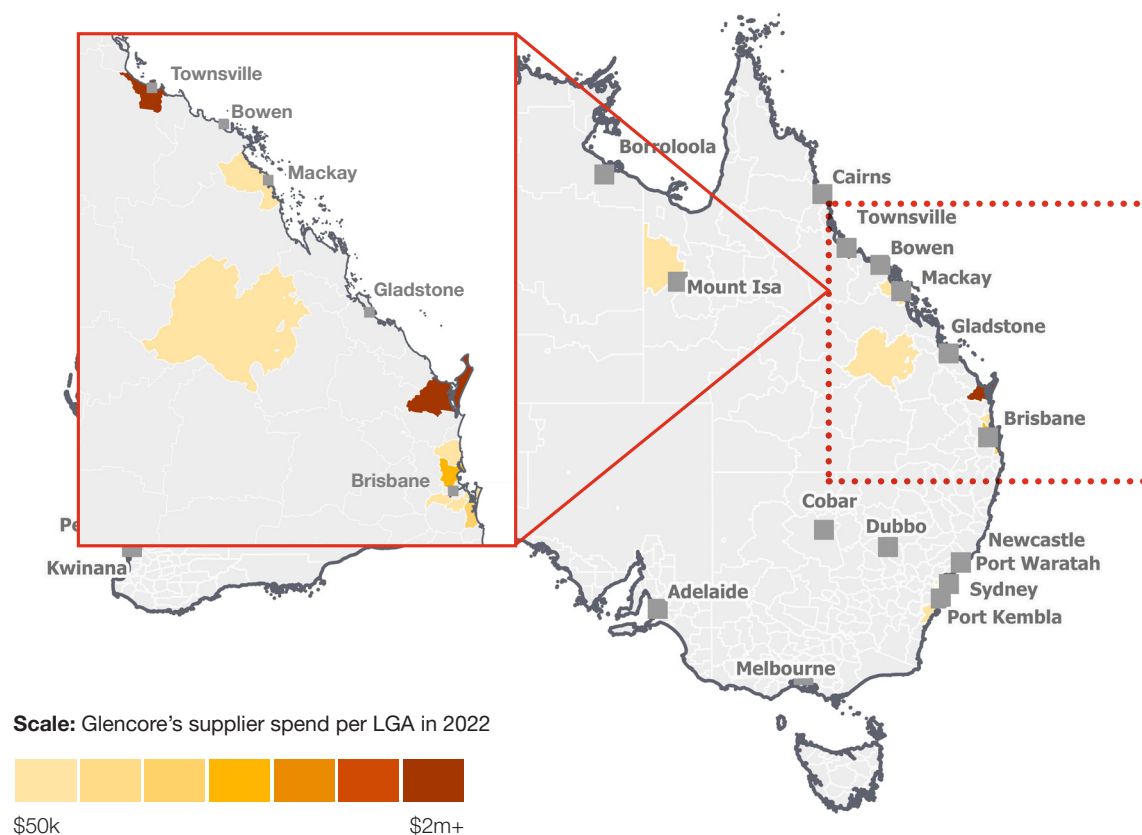
Spent  
**\$580** million  
on suppliers

Directly contracts  
**339**  
people

- Glencore runs a fully-integrated open cut mine and a nickel and cobalt processing plant at Murrin Murrin.
- The nickel and cobalt is exported through Kwinana Port, south of Perth.
- Glencore's Murrin Murrin operation supports the employment of 1,167 people (including direct employees and contractors).

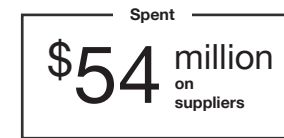
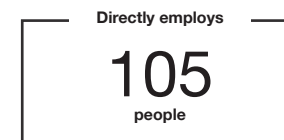
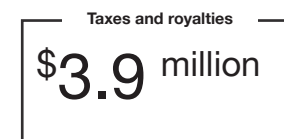
Glencore Technology is Glencore's dedicated metals product and process innovation branch. With its headquarters in Brisbane, Glencore Technology develops innovative products that help producers extract more from their metal and mineral processing assets.

## Glencore Technology supplier spend footprint by LGA (\$m)



Source: PwC (2023) Analysis of Glencore supplier spend inputs in 2022

Note: Supplier spend of below \$50,000 in an LGA is not illustrated on the above map



- Glencore Technology provides comprehensive, tailored solutions involving integrated process and equipment design, detailed engineering, equipment supply, operator training, commissioning assistance and ongoing process and maintenance support.
- 22 of the 27 mining companies within the International Council of Mining and Metals (ICMM) use Glencore Technology to improve operational efficiency.

# 05

## Appendix

## Our approach

For the purposes of this study, we have a national economic model to estimate key economic variables across Australia, including direct and indirect employment and direct and indirect economic activity (measured as Gross Value Added, or GVA). These results form the basis for understanding the economic contribution of Glencore in Australia in 2022. Additional detail on our approach is outlined below.

### Estimating the direct impact

#### Collect detailed data on Glencore's operations

We collected detailed data on Glencore's operations in 2022, covering a range of areas, including:

- supplier spend for each of Glencore's 25 operations around Australia by postcode
- total revenue across Australia
- the number of full time employees and contractors at each mine and associated wages paid by postcode
- community contributions to each organisation, by postcode
- local council payments
- taxes and royalties.

#### Map suppliers to industry categories

We mapped suppliers to their respective ANZSIC classifications<sup>16</sup> based on the nature of their services to Glencore.

#### Map suppliers and employees by postcode and LGA

- Location of suppliers was mapped from their postcode to the corresponding LGA.
- Employees were mapped by their place of residence to the corresponding LGA.
- Concordance from postcode to LGA was undertaken using respective area size and economic activity, and apportioned appropriately to reflect activity in the area.

#### Identify the direct economic impact of Glencore in Australia

The LGA concorded information is used to develop direct economic contribution figures. An illustration of the different components of the direct and indirect GVA calculation is outlined in the chart on the right.

### Estimating the indirect impact

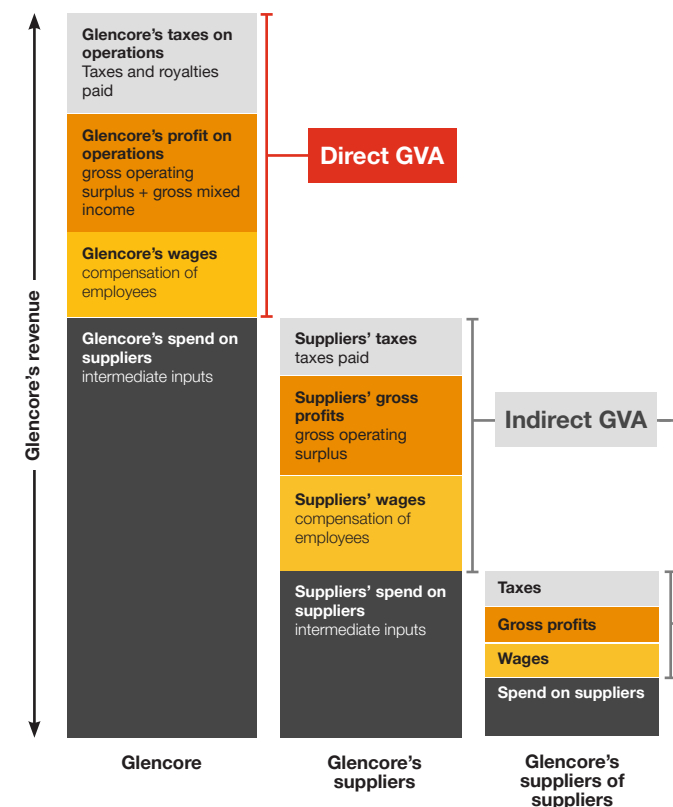
#### Identify indirect economic impact of Glencore in Australia using input-output

- Input-output (IO) tables<sup>17</sup> were used to estimate the indirect impact of direct expenditure on suppliers and employees by Glencore.
- The IO multipliers are representations of the indirect activity that will be enabled by the direct spend of Glencore. This is driven by the type of spend (as determined by the ANZSIC classifications) and the amount (as determined above).

#### Estimate the geographic impact of indirect economic impacts using gravity modelling

- The IO model multipliers are representations of what industries will be impacted, but not where the activity will flow.
- We account for the inter-regional trade for indirect goods and services spend based on a gravity model, which estimates economic flows across Australia.

### Components in estimating direct and indirect GVA



Source: PwC (2023)

<sup>16</sup> ABS ANZSIC Classification  
<sup>17</sup> ABS Input-Output Tables

## Summary of methodology and limitations

### Input-Output modelling

IO modelling is a powerful tool for calculating how the impacts of activity in one industry affect the broader economy through established intra- and inter-industry relationships. Our IO modelling assesses the interdependence between Glencore and the rest of the economy using economic multipliers. IO multipliers are one way to estimate the total economy-wide contribution of direct and indirect economic activity for a particular industry.

#### Direct effects

The direct effects of an industry measure the requirements for an extra dollar's worth of output. In simpler terms, the direct effect on an industry's output is a one-dollar change in output that results from a one-dollar difference in final demand. This, in turn, affects the GDP, employment, and income associated with that industry. The direct effects were estimated using information taken directly from Glencore (i.e. spending on its suppliers).

#### Production-induced indirect effects

These effects measure the change in inter-industry purchases as a response to the demands of the directly affected industries. This includes the chain-reaction of output up and down the production supply chain, thereby creating a ripple effect.

### Gravity modelling

A gravity model is a spatial interaction tool that estimates the volume of interaction between or among places. Initially developed for physics, it was later repurposed as a tool for estimating trade or interaction between regions by Isard (1954).

To estimate the flow of indirect economic activity between regions, we have developed a gravity model that considers the scale of economic activity in an LGA measured by its GVA and the relative distance between every other LGA (taken as the distance from centroid to centroid).

In the context of Glencore's operations, the model is used to estimate the location of indirect impacts of the company's spending on suppliers of suppliers.

### Limitations of our modelling

#### ANZSIC classification

Our supplier classification system is based on the primary good or service provided by each supplier to Glencore. While this approach has enabled us to categorise suppliers into 19 key industries, it is important to note that some suppliers may provide a range of goods and/or services across multiple industries or categories. Therefore, our classification system may not fully capture the diversity of goods and services provided by each supplier.

#### Input-output modelling

Overall, while IO modelling is a common form of economic modelling, there are several limitations that must be considered when interpreting the results. These limitations include:

- **Static picture of the economy:** IO modelling assumes a fixed economy structure and does not consider dynamic adjustments that may occur as a result of potential future shocks.
- **Fixed production coefficients and constant returns to scale:** The approach assumes fixed production coefficients and constant returns to scale. This means that no matter how much is produced, the per-unit cost of required inputs remains the same.
- **Average effects, rather than marginal effects:** The method considers average effects, rather than marginal effects, meaning that IO models do not take into account economies of scale, unused capacity, or technological change.
- **Unlimited availability of production inputs:** IO modelling assumes unlimited availability of production inputs, such as labour, capital and equipment, and land. This implies that there are no supply-side constraints in the modelling.
- **No account for price changes:** The approach does not account for price changes that may result from increased competition for scarce resources.
- **Effect of technology on productivity and production efficiency improvements:** IO modelling does not consider the effect of technology on productivity and production efficiency improvements.

