

Australia's National Science Agency

Australian attitudes toward mining

Citizen survey: 2024 results



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Executive summary

This report presents the findings from the 2024 national survey on Australian attitudes toward mining, building on previous surveys conducted in 2014 and 2017. The results show important shifts in public perception, with trust in the mining industry improving from 2.8 in 2014 to 3.1 in 2024 (on a 1-5 scale) and acceptance also increasing. However, further improvement is contingent upon the industry's ability to address environmental concerns, engage with communities transparently, and ensure fair distribution of economic benefits.

A key focus of this 2024 survey is the role of critical minerals in the transition to renewable energy. Public awareness of the importance of these minerals is high, with 66% of respondents supporting the streamlining or simplifying of regulations to expedite the transition to renewable energy and 73% recognising that having access to critical minerals (essential for achieving net zero emissions) requires increased mining activity. Yet, concerns remain about environmental impacts from mining, such as its effects on water and ecosystems, with 61% of participants in agreement that mining has negative impacts on the environment.

Public trust in the mining industry is strongly linked to procedural fairness, with community engagement and governance playing central roles in maintaining the industry's social licence to operate. This points to the growing importance of local mining communities working with the industry and holding them accountable, reflecting a shift in public expectations around transparency and local involvement. Another strong predictor of social acceptance is the extent to which the perceived benefits of mining (e.g. economic value) outweigh its negative impacts (e.g. environmental impacts). While the economic contribution of mining is widely recognised, with 72% agreeing that it supports Australia's prosperity, the industry must continue to balance its economic role with environmentally and socially sustainable practices to maintain public support. As Australia's mining sector expands to meet the global demand for critical minerals, maintaining trust, actively engaging with communities, ensuring equitable local and wider societal benefits, and addressing local environmental concerns, and highlighting mining's role in the energy transition, will be critical to its long-term success.

For a more detailed summary, see our survey snapshot. For a more detailed discussion of the survey findings, see the Discussion and conclusion section at the end of this report. Explore the survey data more interactively via the survey dashboard on CSIRO's website.

Key findings:

- Public trust in the mining industry has improved.
- 73% of respondents acknowledge that access to critical minerals is essential for achieving net zero emissions.
- 71% agree that mining is important to the Australian way of life.
- 72% believe mining will support Australia's future prosperity.
- Despite strong support for mining, 61% agree that mining has negative environmental impacts.
- 32% of respondents believe Australia should reduce mining activity, even if it delays the transition to net zero emissions.
- Whilst the economic contribution of mining and its importance in supporting the energy transition are widely recognised, building trust, ensuring fair distribution of benefits, and actively engaging communities are key to maintaining the industry's social license (52% of participants agree that mining communities receive a fair share of benefit).



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Introduction

The mining industry has long been a cornerstone of Australia's economy, driving growth through the extraction and export of valuable resources. Over the past decade, the sector has contributed more than \$2.1 trillion in export revenue, \$241 billion in wages, \$132 billion in company taxes, and \$106 billion in royalties, underpinning 21% of the nation's economic growth¹. This economic contribution highlights the critical role mining has played in building Australia's prosperity.

However, as the world faces the urgent challenge of climate change, the mining industry's role is rapidly evolving. Broadening from the extraction of traditional commodities, the industry now finds itself at the heart of the global energy transition. Critical minerals such as lithium, cobalt, nickel, and rare earth elements (REEs) and strategic materials like copper and manganese, that are all essential for renewable energy technologies like batteries and electric vehicles—have become a key focus. These minerals are not just resources, they are the building blocks of a sustainable future. The International Energy Agency (IEA) forecasts significant increases in the demand of selected minerals to support the energy transition (Figure 1)². Australia's vast deposits of both critical minerals and strategic materials position the country as a global leader in this transition, with over 80 major critical minerals projects in the pipeline as of December 2022, representing up to \$42 billion in investment value and the potential creation of 115,100 jobs in the Australian economy to 2040³. The question for Australians is the extent to which they want the critical minerals required for the energy transition to be mined in Australia.

¹ Minerals Council of Australia. (2024). Annual Report 2023. Retrieved from https://minerals.org.au/wp-content/uploads/2024/06/MCA-Annual-Report_2023.pdf

² IEA (2021), Growth in demand for selected minerals from clean energy technologies by scenario, 2040 relative to 2020, IEA, Paris https://www.iea.org/ data-and-statistics/charts/growth-in-demand-for-selected-minerals-from-clean-energy-technologies-by-scenario-2040-relative-to-2020, Licence: CC BY 4.0

³ Commonwealth of Australia. (2023). Critical Minerals Strategy 2023-2030. Retrieved from https://www.industry.gov.au/sites/default/files/2023-06/criticalminerals-strategy-2023-2030.pdf





For context, Australia already contributes significantly to the global production of critical minerals and strategic materials to support the energy transition. In 2022, Australia produced 52% of the global supply of lithium, 3.1% of its cobalt, 4.5% of its nickel, and 5.3% of its REEs⁵. Australia was also the sixth-largest producer of copper⁶. A key difference in the expansion of mining of critical minerals essential for the energy transition, is that much of the material to be extracted under an expanded resource strategy will occur in areas that do not necessarily have experience with exploration and extraction of critical minerals (e.g., vanadium extraction in northwestern Queensland)⁷. In addition, some of Australia's most disadvantaged local government areas (LGAs) host the highest number of critical minerals mines and mineral deposits⁸. Figure 2 provides a map of known critical mineral deposits and mines in Australia.

Underscoring the importance of careful planning and consideration of the social context for development of these commodities and deployment of the infrastructure they are used to create, recent modelling by Net Zero Australia estimated that 43% of all clean energy infrastructure required for Australia to reach its net zero emissions target by 2050, would need to be on Indigenous lands⁹. A comparative study of seventeen government critical mineral strategies found that twelve did not mention any terms or references to Australia's First Nations people and three connect to pre-existing empowerment programs. Only the Critical Minerals Strategy 2023-2030 mentions the right of Indigenous Peoples to Free Prior and Informed Consent (FPIC)¹⁰.

⁴ The Sustainable Development Scenario describes the broad evolution of the energy sector that would be required to reach the key energy-related goals of the United Nations, including the climate goal of the Paris Agreement (SDG 13), universal access to modern energy by 2030 (SDG 7), and a dramatic reduction in energy-related air pollution and the associated impacts on public health (SDG 3.9).5 (Geoscience Australia. (2024, March 5). Critical minerals at Geoscience Australia. https://www.ga.gov.au/scientific-topics/minerals/critical-minerals)

^{5 (}Geoscience Australia. (2024, March 5). Critical minerals at Geoscience Australia. https://www.ga.gov.au/scientific-topics/minerals/critical-minerals)

^{6 (}Department of Industry, Science and Resources (2022). Copper | Resources and Energy Quarterly https://www.industry.gov.au/sites/default/files/minisite/ static/8f915ab4-c06d-41cf-98ee-5bc628230bdc/resources-and-energy-quarterly-september-2022/documents/Resources-and-Energy-Quarterly-September-2022-Copper.pdf)

⁷ Critical Minerals Strategy 2023–2030, Australian Government Department of Industry, Science and Resources.

⁸ Burton, J., Kemp, D., Barnes, R. and Parmenter, J. (2024). A socio-spatial analysis of Australia's critical minerals endowment and policy implications. *Resources Policy 88* https://www.sciencedirect.com/science/article/pii/S0301420723011595

⁹ Pascale, A, Davis, D, Watson, J, Smart, S, Brear, M, McCoy, J, Lopez Peralta, M, Keenan, R, Eckard, R, Reside, A, Ward, M, Possingham, H. (2023). Downscaling – https://www.netzeroaustralia.net.au/wp-content/uploads/2023/04/Downscaling-Land-use-impacts-on-Australian-communities-the-land-sea.pdf.

¹⁰ Sinclair, L. & Coe, N. M. (2024). Critical mineral strategies in Australia: Industrial upgrading without environmental or social upgrading. Resources Policy 91 https://www.sciencedirect.com/science/article/pii/S0301420724002277



- Bismuth, +/- Cobalt, +/- Indium
- Chromium, +/- Cobalt, +/- Nickel, +/- PGE
- Cobalt
- Nickel, +/- Cobalt, +/- PGE
- Platinum Group Elements (PGE), +/- Cobalt, +/- Nickel
- Scandium, +/- Cobalt, +/- PGE, +/- Nickel
- Fluorine
- Oraphite
- High Purity Alumina
- Indium
- Lithium, +/- Tantalum, +/- Niobium
- O Magnesium

- Molybdenum, +/- Rhenium
- Heavy Mineral Sands (HMS) Titanium, Zirconium
- HMS Titanium, Zirconium, REE
- Rare Earth Elements (REE)
- REE, Zirconium, Niobium, +/- Hafnium, Lithium, Tantalum, Gallium
- O Silicon (High Purity Silica/Quartz)
- Tungsten
- Tungsten, Molybdenum
- Titanium
- Titanium, Vanadium
- Vanadium
- Vanadium, Molybdenum

Figure 2: Australian critical mineral deposits and mines in 2023 (Geoscience Australia)¹¹

¹¹ Critical minerals at Geoscience Australia https://www.ga.gov.au/scientific-topics/minerals/critical-minerals

As global demand for minerals, particularly those essential to the energy transition intensifies, the mining industry must not only meet demand but also adhere to high environmental and social standards. To achieve the Paris Agreement targets, it is estimated the world will require over 260 new lithium, cobalt, nickel and copper mines by 2030, representing an investment of around US\$4 trillion¹². Australia's ability to fulfill this demand will have significant implications not only for the global economy but also for the fight against climate change. With significant critical minerals and strategic materials located in Australia, the opportunity is significant.

Given the industry's significant role in both the economy and the energy transition, understanding public sentiment towards mining is more important than ever. This is why we conducted a large-scale survey of Australians, aiming to capture their views on the mining industry, the extraction of critical minerals, and the conditions necessary for the industry's continued acceptance. Public trust and acceptance—often referred to as the industry's social licence to operate—are not just important, they are critical for the industry's ability to secure ongoing support from the community. This is especially true as the industry expands into new areas of resource extraction, where maintaining trust is key to long-term success.

This national survey of Australian attitudes toward mining is the third in a long-term program of research funded by CSIRO. The first survey report was published in 2014 and the second in 2017. With the 2024 data published in this report, longitudinal patterns are explored to support CSIRO's long-term commitment to enhance and inform the public conversation about Australia's remarkable national resource endowment. The research is also vital in shaping research priorities for CSIRO, to deliver innovation that solves the challenging, complex problems faced by minerals companies, mining equipment, technology and services (METS) companies, governments and policy makers, and other industry stakeholders.

Reflecting the changing political landscape, the focus of the survey shifted from a hydrocarbons and coal-dominated narrative in 2014 and 2017, to one dominated by metalliferous minerals in 2024. Importantly, commonality of questions was preserved allowing statistically meaningful trends to be identified.

The survey results reveal that while trust in the mining industry has improved, there are still significant challenges ahead. The public's acceptance of mining, though also on the rise, is contingent upon the industry's commitment to environmental stewardship, community engagement, and transparency.

These factors are crucial as the industry seeks to balance economic growth with the ethical and sustainable practices demanded by both the Australian public and the international community.

This report delves into these evolving perceptions, offering a comprehensive analysis of the conditions under which Australians are willing to support the mining industry's future. It explores how the sector can maintain and strengthen its social licence to operate, particularly in the context of the critical minerals that are key to Australia's role in the global energy transition. The insights gathered in this report will not only guide the mining industry in navigating the challenges ahead and CSIRO in its research and community engagement priorities, but will also play a crucial role in ensuring that Australia's path to a sustainable future is inclusive, responsible, and aligned with public expectations.



Methods

The survey was conducted between 3 March and 11 April 2024. In line with project aims to ensure all Australians age 18 and over had an opportunity to contribute their views regarding this important industry, two main recruitment methods were used. To collect a nationally representative sample of Australians, the primary data collection method used an online research panel. In addition, a second, separate sample of participants was collected utilising an open call approach via social media advertising, a press release and direct invitation.

In total, 6,448 surveys were collected and retained after data cleaning¹³ comprising 5,724 via research panel (representative of national population by age and gender; 88.8% of total sample) and 724 via the open call approach (11.2% of total sample).

All participants were 18 years or older. In addition to age and gender, quotas were used in the research panel sampling to ensure Australians from all states and territories were included at rates similar to census data distributions and the sample reflected regional and remote perspectives as well as urban and metropolitan perspectives. The survey took approximately 20 minutes to complete. Research panel participants were asked questions regarding demographics and quota screened before then proceeding to the main survey content.

Ethics review

The research project was reviewed by the CSIRO Human Research Ethics Committee (approval number: 115/23) and all procedures adhered to the National Statement on Ethical Conduct in Human Research¹⁴.

^{13 &#}x27;Data cleaning' is conducted in order to ensure the quality of data included in analyses is high. This involves screening and potential removal of surveys where, for example, participants answered the survey very quickly (i.e. less than 5 minutes), in ways that indicate lack of attention to the content of questions, and extreme or consistent responding on survey questions (i.e. answering '1' to all questions). For more detail on what this involves, see Meade AW and Bartholomew C. (2012) Identifying careless responses in survey design. Psychological Methods, 17(3), 437-455. DOI: 10.1037/a0028085.

¹⁴ National Health and Medical Research Council, Australian Research Council and Universities Australia (2023). National Statement on Ethical Conduct in Human Research. Canberra: National Health and Medical Research Council. http://www.nhmrc.gov.au/about-us/publications/national-statement-ethicalconduct-human-research-2023

Definition of mining

In 2014 and 2017, the definition of mining used in this survey research program was broad, encompassing:

- coal mining
- oil and gas extraction (for example, crude oil and coal seam gas)
- metal ore mining (for example, iron ore)
- non-metallic mineral mining and quarrying (for example, limestone, silica and clays), and
- exploration and other direct mining support services (for example, mineral exploration, mining contractor).

In 2024, this definition was modified to reflect the emphasis in this survey on minerals and metals related to the energy transition. Oil and gas extraction were also excluded from the refined definition. The revised definition used was:

'For the purposes of this survey, mining is defined as the extraction of minerals, metals and other substances of value from the earth. The mining industry in Australia involves a broad range of activities, including:

- metal ore mining (e.g. iron ore, copper, gold)
- mining of critical and rare earth minerals (e.g. cobalt, tungsten)
- non-metallic mineral mining and quarrying (e.g. limestone, silica and clays)
- coal mining (i.e. metalliferous coal for metal smelting and brown coal for energy generation).

The mining life cycle includes several stages including exploration for new mineral and metal resources, discovery, mine development, production and mine closure and reclamation/rehabilitation.' To ensure that this change in definition did not unduly influence comparisons of survey items across time, a sub-sample of 325 panel-based participants were presented with the old definition and their survey results compared to the responses of the remainder of the panel-based sample who were presented with the new definition. Detailed analyses revealed no significant differences between the two samples and all data was used in subsequent analyses and reporting.

Survey measures

The survey instrument measured public sentiment on a range of topics related to the mining industry in Australia, its relationship with the Australian public and renewable energy transition, including:

- the socio-cultural position of mining in Australia
- self-rated knowledge and information sources about the mining industry
- environmental and economic impacts
- equity, diversity, and inclusivity of mining
- procedural (such as industry responsiveness) and distributional (such as a fair share of the benefits) fairness
- attitudes toward climate change, renewable energy and material critical to supporting a renewable energy transition
- governance and regulation
- trust in and acceptance of mining in Australia
- participant demographic characteristics.

Response scales

A combination of scales was used in this survey to examine different types of community perceptions and to enable accurate comparison with past surveys in this program of research where items were repeated. These different responses scales were:

- 5-point Likert-type response scales (e.g. 1 = not at all to 5 = extremely)
- 7-point Likert-type response scales (e.g. 1 = strongly disagree to 7 = strongly agree).

When reporting, response categories may be combined to express 'agreement' (combining results of participants selecting agreement categories on either 5- or 7-point scales) and 'disagreement' (combining results of participants selecting disagreement categories on either 5- or 7-point scales).

For the demographics questions, participants were asked to choose the most relevant category, and there were three open text boxes which allowed respondents to offer openended answers to the question 'can you name any specific critical minerals', 'can you explain the importance of critical minerals in the transition to renewable energy' and 'are there any aspects about mining that you would like to know more about?'

Gender

In the survey, we asked participants to describe their gender by selecting either:

- male
- female
- non-binary
- prefer to self-describe
- prefer not to say.

For analyses using gender as a variable, non-binary participants, those that preferred to self-describe and those who did not disclose their gender were not reported due to low sample sizes precluding any meaningful analyses. Men and women are referred to as male and female in the report.

Reporting of results

This report presents the results of statistical tests from both the 'open call' (n = 724) and 'representative' sample (n = 5,724). Unless otherwise specified in the figure and table headings, analysis is reported for the whole dataset (N = 6,448).

Uncertainty and significance testing

All parameter estimates (for example means, proportions, correlation coefficients, beta coefficients) in survey-based research are based on samples of the population. As this research uses a large sample, most of the uncertainty around parameter estimates is quite low, consequently we often do not report significant testing nor include p-values in this report¹⁵.

¹⁵ As a general rule of thumb when reading this report, a difference in average scores of 0.20 or greater (e.g., between years on the same measure or between groups in the same year) may be considered statistically significant.

Demographics



16 Unless specified, demographic profiles include aggregated data from the total sample



Position of the industry

The mining industry is important to Australia, but where it is positioned in the minds of Australians provides valuable insight. Through the course of this program of research, we have consistently asked Australians to respond to a series of items on this topic. These encompass the role of mining in the economy, the nation's future prosperity, its necessity for Australia, the country's dependence on mining, and participants' moral positioning on mining. General perceptions of, and attitudes towards mining were assessed through a seven-point rating scale ranging from 1 (Strongly disagree) to 7 (Strongly agree).

When asked to consider the costs and benefits associated with mining, the public generally agree that it is worthwhile continuing to pursue mining in Australia (mean score M=5.3), with males (M=5.5) responding more favorably than females (M=5.1). Moreover, this value proposition has strengthened from the baseline measure in 2014 (Figure 3), highlighting an increasingly positive view of mining in the eyes of the Australian community.



Figure 3: Mean agreement ratings for benefits and costs of mining in Australia overall and by gender, over time

The value proposition of mining is supported by an understanding of the importance of the industry by the Australian community. 71% of participants agreed that mining is important to the Australian way of life, and 72% agreed that mining will support Australia's future prosperity.

Over time, perceptions of the contribution of mining to Australia have also strengthened, with the average score for mining's contribution to the economy significantly higher in 2024 compared to both 2017 and 2014. The contribution of mining to the standard of living in Australia is higher than in 2017 but consistent with the 2014 score (Figure 4).



Figure 4: Mean agreement ratings for economic contribution of mining in Australia overall, over time





Trust and acceptance of mining

In previous research, community trust in the mining industry to act responsibly has been identified as a crucial factor in gaining societal acceptance in Australia. Trust acts as a key conduit for translating public expectations and experiences into a strong social licence to operate. As in previous studies conducted in 2014 and 2017, we measured both trust and acceptance in this research. We also include self-rated knowledge of mining in this section. These factors were assessed using a Likert-type scale ranging from 1 (Not at all) to 5 (Extremely).

When participants were asked to rate the extent to which they trust mining to act responsibly, the mean score (M) was 3.1 in 2024. This is above the midpoint of the scale used (i.e. '3') and is an improvement on previous years (M=2.8 in 2014, M=2.8 in 2017; Figure 5).

Acceptance of the mining industry has also improved from the baseline measure (M=3.7 in 2024; M=3.6 in 2014, M=3.5 in 2017). While this represents a substantive improvement over time, there is opportunity to continue strengthening the relationship between the mining industry and Australian community (Figure 5). For reference, a similar 2023 nationally representative survey of Australian attitudes toward rural industries found average trust to be 3.4 and acceptance to be 3.9¹⁷.



Figure 5: Mean trust and acceptance scores, over time

¹⁷ Voconiq (2023) Community Trust in Australia's Rural Industries: Year Four National Survey. Voconiq Australia. https://agrifutures.com.au/wp-content/ uploads/2024/03/24-061-CTRI-Year-4-report.pdf

In 2024, we expanded our approach to measuring trust by exploring different, relevant dimensions of community trust. The core measure, consistently used across all three national surveys to date, focuses on the dimension of integrity—specifically, trust in the mining industry to act responsibly. In this latest research, we also introduced measures that assess competency, defined as 'trusting the mining industry to be the best at what they do,' and humanity, defined as 'valuing your community's needs and desires,' in line with Dietz et al. (2011, 2012)¹⁸.

The mining industry was trusted most for its competency (M=3.5), followed by integrity in acting responsibly (M=3.1), and then for its humanity (M=3.0). These results align with expectations for these measures, given the context of the relationship between an industry and the society in which it operates.

There were significant differences in these dimensions of trust when comparing responses from different groups. Community members who responded to the public call to participate (n = 724) rated their trust in the mining industry to act in the best interests of society much lower than those in the general, representative sample of Australians (n = 5,724; Figure 6).

Additionally, participants who know at least one person working in the mining industry reported significantly higher trust in the industry's responsibility compared to those who don't, a consistent pattern across most of the 2024 survey measures (Figure 7). Trust in this area has significantly increased for both groups since 2014, with a greater rise observed among those who know someone in the industry.



Figure 6: Mean trust score (humanity dimension) overall and by sample type



Figure 7: Mean trust score (integrity dimension) overall and by number of people known in the mining industry, over time

¹⁸ Dietz, G., & Gillespie, N. 2011 Building and repairing organisational trust. London: The Institute of Business Ethics. Dietz, G. & Gillespie, N. 2012. The recovery of trust: Case studies of organisational failures and successful trust repair. London: The Institute of Business Ethics.

Similarly, self-reported knowledge of mining has increased substantially since 2014. For participants aged 18-24, 35-44, and 45-54 years, this self-reported knowledge has grown significantly since 2017 (Figure 8).



(self-rated) Knowledge about the mining industry

Figure 8: Mean ratings of self-rated knowledge about the mining industry overall and by age category, over time





The benefits of mining

The mining industry plays a prominent role in the national conversation about economic strength and prosperity. We asked questions about the role of mining in overall employment and for specific demographic groups, the extent to which Australians feel they have personally benefited financially from the mining industry, and the broader secondary benefits through infrastructure investment in regional Australia associated with mining.

Employment

Most participants indicated agreement that mining contributes positively to employment in a range of ways. Ratings of the contribution of mining to creating jobs for Australians increased in 2024 compared to previous surveys in this research program (2024 *M*=5.7; Figure 9). A similar increase in agreement was seen in assessments of the industry's role in providing opportunities for regional employment and training.

In addition, 78% of participants agreed that mining provides employment and training opportunities for young people, 66% agreed with the same sentiment for Australia's First Nations people and 74% for women (Figure 10).



Figure 9: Mean agreement ratings that mining contributes to employment in Australia over time



Figure 10: Percentage agreement with employment benefit questions

Personal financial benefit

Most participants (54%) agreed that mining had made no difference to their personal finances although 50% of participants agreed that the average Australian is wealthier because of the mining industry (Figure 11).

On this second measure (the average Australian is wealthier), the mean rating increased significantly from 2017 and 2014 (M=4.0, both) to 4.4 in 2024.





Infrastructure benefits in regional Australia

In 2024, there was a strong positive view that the mining industry has helped improve transport infrastructure (70% agreement), communications and information technology infrastructure (68% agreement) and social infrastructure (63% agreement) in regional Australia (Figure 12). On all three of these dimensions, mean scores have improved consistently and significantly in each year of the program of research. Residents in states where mining activity is significant (for example, Western Australia and Queensland) indicated greater agreement on all three measures compared to people in states and territories where mining is less prominent (for example Tasmania, Australian Capital Territory). There were no differences in the responses of participants that live in metro vs non-metro areas across all three infrastructure measures, with average scores on each increasingly positive in each national survey conducted (see Figure 13 for illustration of this pattern).



Figure 12: Percentage agreement infrastructure benefit questions



Mining has helped improve communications and information technology infrastructure in regional Australia

Figure 13: Mean agreement ratings of communications infrastructure benefits overall and by participant location, over time



Concerns about mining

Mining, as an extractive industry, affects the environment and raises concerns among community members about its broader practices. In this third national survey of the Australian attitudes toward mining research program, we investigated these concerns and tracked how they have evolved over time.

Environmental impacts

We explored participants' perceptions regarding the statement, 'mining has negative impacts on the environment,' and found that 61% agreed, with an average score of 4.8 on a 7-point scale. This aligns with the overall ratings from the 2017 survey (Figure 14). When examining specific environmental impacts, 52% of participants agreed that mining 'negatively affects water quality (both groundwater and surface water).' Notably, the average score for this measure has decreased from 4.8 in 2017 to 4.6 in 2024, indicating a less negative perception (Figure 14).

Additionally, 53% of participants agreed that mine site rehabilitation is important to them. However, with 31% of respondents giving a neutral response, there is an opportunity to enhance understanding of what mine rehabilitation entails and the responsibilities of mining companies in this process.



Figure 14: Mean agreement ratings environmental impact measures overall, over time

For the first time, we also asked participants to what extent they believe the act of mining itself and the products derived from mining contribute to climate change. In response, 54% and 55% of participants agreed with these two items, respectively (Figure 15).

The effect of mining on other sectors

Participants were asked to rate the extent to which they agreed that mining negatively impacts other sectors. For the manufacturing sector, 47% of participants disagreed that mining has a negative impact (21% agreed, and 32% were neutral). Similarly, 42% disagreed that mining affects the tourism sector (30% agreed, and 27% were neutral). The tension between mining and agriculture was more pronounced, with 44% agreeing that mining negatively impacts agriculture, while 28% disagreed (29% were neutral). The perception of mining's impact on agriculture has decreased significantly since 2017, with the mean score dropping from 4.6 to 4.2 in 2024.

There were no significant differences in these perceptions between participants living in metropolitan areas and those in non-metropolitan areas, with the same broad pattern observed across all three sectors.

Health impacts of mining

Finally, we examined the perceived impacts of mining on the health and safety of people who work at mine sites and the communities that are located near mining sites. 55% of participants agreed with the statement 'mining has a negative impact on the health of mine employees' (20% disagreed and 25% were neutral). 45% of participants agreed 'mining has negative impacts on the health of local communities' (30% disagreed and 26% were neutral; Figure 16). In 2024, mining employees¹⁹ rated community impacts significantly lower (M=3.9) than non-mining employees (4.4), as they did the impacts on the health of mine employees (M=4.3 vs 4.7, respectively).

When we explored Australians' views on the effects of Flyin, Fly-out (FIFO) and Drive-in, Drive-out (DIDO) workforce strategies in the mining industry, opinions were evenly split, with 36% agreeing and 36% disagreeing that these strategies negatively affect local communities. Interestingly, the average score for this measure was higher among mining employees (M=4.4), indicating greater agreement that these strategies have a negative impact, compared to non-mining employees (M=4.1). However, when asked whether these are sensible workforce management strategies, both mining employees (M=5.3) and non-mining employees (M=4.8) showed strong agreement.



^{19 306} participants, 4.8% of the total sample, indicated they were employed in the mining industry and care should be taken in interpreting this comparison.

Weighing up benefits and impacts

After participants completed sections of the survey focused on both the positive benefits and negative impacts of mining, they were asked to respond to the following statement on a 7-point scale, where higher scores indicate stronger agreement:

'Considering the benefits and costs associated with mining, it is worthwhile to pursue mining in Australia.'

The overall mean score for this measure was 5.3, indicating strong agreement with this sentiment. The perceived value of mining has also increased significantly since 2014 and 2017, when the mean score was 5.0 (Figure 17). This sentiment was notably stronger among male respondents (M=5.5) compared to female respondents (M=5.1), higher among older participants (M=5.8, 65+ years) compared to younger participants (M=4.8, 18-24 years), and more pronounced among those who know at least one person working in the mining industry (M=5.4) compared to those who did not (M=5.1). As expected, mining employees themselves showed much higher agreement with the statement (M=6.1) than non-mining employees (M=5.2).



Considering the benefits and costs associated with mining, it is worthwhile to pursue mining in Australia

Figure 17: Mean agreement rating of benefits balanced against costs for Mining in Australia overall, by age group and over time



Energy transition minerals and renewable energy

In this focus area of the 2024 national survey of Australian attitudes toward mining, we examined community perspectives on what are known as energy transition minerals. These are the minerals, metals and rare earth elements that are necessary in a range of ways to support the transition to renewable energy. In this section, we detail community understanding of and attitudes toward the importance of transitioning to renewable energy, awareness of transition minerals themselves, and the terms of social acceptability for their extraction in Australia.

Importance of the energy transition and critical minerals

First, we examined the underlying case for transitioning to renewable energy sources. 66% of participants agreed that 'it is important for Australia to urgently transition to renewable energy to combat climate change,' while 17% disagreed and 17% remained neutral. Using a 7-point response scale, support for this statement was significantly higher among participants aged 25-34 years (M=5.2) and 35-44 years (M=5.3) compared to both younger participants (18-24 years; M=5.0) and older age groups (55-64 years, M=4.9; 65+ years, M=4.7). Participants living in the ACT expressed stronger agreement with this statement than those in other states and territories, particularly in comparison to Queensland residents (M=5.6 vs. M=4.7).

Second, there was strong agreement that critical minerals are essential for the development of renewable energy technologies, with 79% of participants agreeing (M=5.6).

Similarly, 72% agreed that Australia needs an increased supply of critical minerals to transition to renewable energy (M=5.3). Additionally, 73% acknowledged that 'having access to critical minerals requires increased mining activity' (M=5.3).

What is required to meet renewable energy targets

We then asked a series of questions about the significant increase in transition minerals required to achieve a net zero emission future. 64% of participants agreed that 'mining is necessary to achieving a net zero emission future,' while 9% disagreed and 27% were neutral.

Similarly strong agreement was observed when participants were asked whether they 'support increased mining activity in Australia if it means reaching net zero emissions targets sooner,' with 65% in agreement, 12% in disagreement, and 23% neutral.



Additionally, 66% of Australians supported the streamlining or simplifying of regulations to expedite the transition to renewable energy (11% disagreed, and 23% were neutral). A large majority also agreed that 'government policies and regulations play a significant role in the length of time it takes to transition to renewable energies' (76% agreed, 6% disagreed, and 18% were neutral). However, a significant minority (32%) agreed that 'Australia should reduce mining activity, even if it means taking longer to reach net zero emission targets' (43% disagreed, and 25% were neutral; Figure 18). This sentiment was stronger for younger age cohorts (Figure 19).



Australia should reduce mining activity, even if it means taking longer to reach net zero emissions targets

Figure 19: Mean agreement mining activity should reduce overall and by age group

Highlighting the complexity of the issue, 47% of participants preferred mining to occur in Australia for the critical minerals needed domestically, while 27% favoured a mix of domestic and imported sources, and 4% preferred relying solely on imports. The way these issues are framed clearly influences how community members approach them.

Conditions of acceptability

Participants were asked to rate the importance of 13 factors in 'making the mining of critical minerals in Australia more acceptable' (outlined below in order of preference). Factors focused on working conditions for mine workers and environmental management were considered most important to participants, rated on a 5-point scale where higher scores indicated greater importance.

Australians surveyed have strong views regarding the process of transition for affected individuals and communities. 64% of participants agreed that 'it is important to protect the jobs of workers in fossil fuel related industries' (16% disagreed and 20% indicated a neutral score). Just 40% of participants agreed that workers in fossil fuel related industries are receiving enough support to find alternative career pathways in the transition to renewable energy (22% disagreed). On this measure, 38% of participants selected a neutral position indicating a lack of awareness or position on whether existing support is adequate. Finally, 75% of participants strongly agreed that it's important to give affected industries and communities enough time to adapt during the transition by creating new job opportunities and providing education and training. This response was consistently high across both metropolitan and non-metropolitan areas, all states and territories, and whether participants knew someone who worked in the mining industry or not. The strength of this sentiment increased with age (e.g., M=5.8 for those aged 65+ years compared to M=5.0 for those aged 18-24 years).

Research and development to support the energy transition

We also explored community sentiment toward research and development to enable the energy transition in Australia. There was strong agreement (85%) that 'research and development plays an important role in the transition to renewable energy' (3% disagreed and 12% indicated a neutral response).

Community members also indicated strong endorsement that 'it is important to make research and development products for the renewable energy transition widely available' to accelerate this transition (79% agreed, 5% disagreed and 16% were neutral).

Mining acceptability factors: Ranked

1	Ensuring fair treatment of workers, free from sexual harassment ($M=4.21$)
2	Adherence to environmental standards and regulations ($M=4.17$)
3	Commitment to land rehabilitation and restoration post-mining ($M=4.17$)
4	Minimising the impact on local ecosystems and biodiversity ($M=4.14$)
5	Ensuring fair labour practices and worker's rights in the mining industry ($M=4.13$)

Using 1-5 scales, research organisations (e.g., CSIRO; M=3.9), and academic institutions (e.g., universities; M=3.6) received strong, positive ratings in the context of which institutions should be leading this effort (Figure 20).

In the words of Australians

In this section of the survey, we also asked community members to explain in their own words the importance of critical minerals in the transition to renewable energy. Primarily, participants responded that these materials were necessary for the construction of energy generating technologies (for example solar panels and wind turbines), technologies that use renewable energy (such as electric vehicles) and energy storage (for example batteries).

The following comments were typical:

'No critical minerals no renewable energy, simple.'

'The development of renewable energy can ensure energy security and reduce the dependence on fossil energy.'

'It's good to know more about how mining is evolving in Australia towards renewable energy, environmental protection and sustainability, and to offset climate change.' Comments also revealed the tension within the Australian community about increasing mining activity in this country to support a global environmental outcome:

'The environmental/health and economic benefits of ending mining and switching to renewable alternatives far outweigh the cons. We cannot keep contributing to the climate crisis and ruining the lives of future generations by continuing to mine and rely on fossil fuels.'

'The 'transition to renewable energy' is used as an excuse to rip up beautiful land in pursuit of so-called critical minerals, clearly a furphy when the 'critical minerals' already in supply within waste streams are not being recovered or recycled. If they were indeed critical, there would be a focus on recovering what has already been mined rather than destroying more ecosystems.'

'What exactly are the environmental impacts of critical minerals mining for transition to renewables; do the negatives 'cancel out' the future positives?'



To what extent do you trust the following institutions to conduct research and development for the transition to renewable energy?

Figure 20: Trust in institutions for research and development for the transition to renewable energy



Governance

In each year of the CSIRO attitudes toward mining research program, the role of community confidence in governance has been strongly associated with community trust in and acceptance of the mining industry (i.e., its social licence to operate).

In 2024, community confidence that the Australian Government can hold the mining industry accountable has increased, from a mean of 2.9 in 2017 to 3.1 in 2024, overall, using a 1–5-point response scale. The same pattern was observed for ratings of participants' ratings of state governments (2017, M=2.8; 2024, M=3.0; Figure 21). Similarly, community confidence that 'legislation and regulation can be counted on to ensure mining companies do the right thing' has increased significantly, from 2.9 in 2017 to 3.1 in 2024, overall. This improvement was observed consistently across gender groups, age, and metropolitan and non-metropolitan residents. Ratings of confidence in state governments among participants who identified as Aboriginal and/or Torres Strait Islander were considerably higher (M=3.7) than those who did not (M=2.9; Figure 21).



Figure 21: Mean agreement ratings state government power by identification as First Nations overall, over time

Large changes were also observed on participant ratings of confidence that local mining communities have influence on mining industry practices and government policy. On the extent to which participants believe mining communities are capable of ensuring the mining industry 'do the right things for local communities', 54% indicated agreement, 24% indicated disagreement and 21% selected a neutral response. However, the mean score on this item increased significantly from 2017 (M=4.1) to 2024 (M=4.5), noting a 1-7-point response scale (Figure 22). A similar pattern was observed on items examining the power of mining communities to defend their interests together and influence governments' mining policies. Again, these changes were observed consistently across gender groups, age, and metropolitan and non-metropolitan residents.



I think mining communities are capable of ensuring the mining industry do the right things for local communities

Figure 22: Mean agreement ratings that mining communities are capable of ensuring the mining industry 'do the right things for local communities', over time



Fairness

As with governance, how the mining industry engages community members at a national and local, operational level, has been strongly associated with trust and acceptance of the industry throughout this research program. Two types of fairness are assessed in this work: procedural and distributional.

Procedural fairness

Several measures, using a 1–7-point response scale, assessed how much community members feel heard and respected by the mining industry and governments, whether the industry acts on community concerns, follows through on commitments, and involves the community in decision-making processes.

Participants in 2024 indicated much higher levels of agreement that the mining industry listens to and respects community opinions, increasing from a mean score of 3.8 in both 2014 and 2017 to 4.3 in this most recent national survey. This pattern was consistent with ratings on the same measure of the Australian Government and participants' perceptions of state government (Figure 23).

Improvements were also observed for the extent to which participants believe the mining industry is prepared to change its practices in response to community concerns. In 2024, the mean score on this measure was 4.3 compared to 3.9 in 2017 and 3.8 in 2014.



Figure 23: Mean ratings of procedural fairness by group overall, over time

However, the extent to which Australians feel they 'have opportunities to participate in decisions about mining' remained the same in 2024 (M=4.1) as it was in 2017 and 2014.

In addition, we asked participants to rate the extent to which it is necessary to gain the consent of local Indigenous and non-Indigenous communities before mining development takes place. In both cases, agreement was very strong (76% and 68%, respectively). Results on both measures are consistent with previous years (2014 and 2017).

Distributional fairness

Participants were asked to rate their level of agreement on items that examined the fair distribution of benefits from mining in several areas: individual benefits, benefits within mining communities, and benefits at the national level.

Sentiment was evenly split regarding personal benefit, with 34% disagreeing and 35% agreeing that people like them receive a fair share of the benefits from mining (32% neutral). Agreement was higher, however, that mining communities receive a fair share of benefit (52%, 20% disagreed and 28% indicated a neutral response). There were significantly increases in the mean scores on both of these measures in 2024 relative to previous surveys (Figure 24). There was also relatively strong agreement (51%) that Australia receives a fair share of tax from the mining industry (26% disagreed, 23% were neutral). As with the previous distributional fairness items, the mean score on this measure in 2024 (M=4.4) was significantly higher than observed in 2017 (M=3.8) and 2014 (M=4.0), using a 1–7-point response scale.



Figure 24: Mean ratings of distributional fairness by group overall, over time



The pathways to social licence

In each iteration of the CSIRO attitudes toward mining survey, our goal is to identify the optimal pathways for improving the mining industry's social licence to operate in Australia. By doing so, we aim to provide the mining industry, key stakeholders, and the Australian community with a clear understanding of what matters most in this relationship and how it can be strengthened. Given the critical role of mining in Australia's economy, future prosperity, and the renewable energy transition, this task has never been more important.

In the previous sections, we explored community perceptions of the mining industry, including its impacts, the benefits it generates, the fairness of their distribution, and the industry's responsiveness to community sentiment. In this part of the report, we delve deeper to understand why community members hold the levels of trust and acceptance they do. We used a statistical technique called *path analysis*²⁰ to describe how the various facets of this crucial relationship—between the Australian community, the mining industry, and governments—combine to influence social acceptance.

Trust drivers

Consistency over time in the relationship levers

In 2024, the key elements of the Australian mining industry path model remain consistent with those from previous surveys in 2014 and 2017 (Figure 25). Trust in the mining industry is central to our understanding of its social licence to operate – most drivers in the model influence acceptance via trust. This means that as community trust in the mining industry to act responsibly increases, so does acceptance.

Procedural fairness

Working back through the drivers of trust, procedural fairness remains the strongest driver in this year's model. The more that community members feel the mining industry listens to and respects community opinions, is prepared to change its practices in response to community concerns and provides opportunities to participate in decisions about mining, the more community trust the mining and accept its activities. On the first two of these measures, the mining industry is seen to be performing better in 2024 than it did in 2014 or 2017.

²⁰ McCrea, R. (2014) 'Modelling effects of intervening variables using path analysis', In R. J. Stimson (Ed) Handbook for Spatially Integrated Social Science Research Methodology, Edward Elgar ISBN 978-0-85793-296-9

Confidence in governance

The next strongest driver of trust is community confidence in the capacity of governments, and legislation and regulation, to hold the mining industry accountable and ensure it operates in line with its obligations. The consistent presence of these measures in the path model over the three national surveys in this program of research demonstrate that social licence is 'everybody's business'. Working to build community confidence in the capacity of these institutions to represent and protect community interests is important. The comparison of data across the three national surveys in this program of research show that in 2024 community confidence in governance mechanisms is significantly higher than it has been previously.

Environmental impacts

As in previous surveys, the more negative environmental impacts Australians associate with the mining industry, the lower their trust in it. This applies to both specific impacts, such as those on water resources, as well as to broader environmental concerns. It also extends to the connection community members make between mining activities, the products of mining, and climate change. The climate dimension, introduced in 2024, highlights the tension between the need for increased mining to address climate challenges and the environmental impacts this activity may generate. This survey's results clearly reflect this tension, with participants acknowledging that while increased mining is necessary for the energy transition, a significant portion of sentiment favours reducing mining activity in Australia, even if it affects the timeline for achieving renewable energy targets.

Mining community agency

In a departure from past years, the third strongest driver of trust is confidence in local mining communities to hold the industry accountable and influence mining related government policy. This is the first time these measures have been found to significantly influence trust in this research program and illustrates the elevation of local community agency in achieving broader social acceptance of mining.

In the context of what is required to grasp the opportunity of the renewable energy transition through increased extraction of energy transition minerals in Australia, this is a compelling change in the model structure. How local communities are treated by mining companies, and the extent to which they can negotiate the terms of their acceptability of mining activity is now influencing the social licence to operate of the industry at a broader societal level. This is particularly important for communities that have never experienced mining previously that will host new projects to access energy transition minerals. Broader Australian confidence in local communities to have agency in their relationships with mining companies is high and has increased since 2017.

Distributional fairness

The last of the trust drivers is distributional fairness. Trust in and acceptance of the mining industry is in part dependent on the extent to which Australians feel their country and the communities directly impacted by mining receive a fair share of the significant benefits generated by the mining industry. On most measures of distributional fairness, a significant improvement in this sense of equity was observed in 2024 relative to previous surveys in this program of research.

Acceptance drivers apart from trust

Benefits outweigh impacts

The more community members feel the benefits of mining outweigh its impacts, the stronger social acceptance of mining is. Ensuring that this balance is net positive is a very important component of the mining industry's social licence to operate in Australia. Currently, this balance is positive and has improved since 2017.

Economic contribution of mining

Similarly, as the economic contribution of mining to the Australian economy increases, so does societal acceptance of the industry. This relationship extends beyond basic economic contributions to include the perceived impact of mining on Australia's standard of living, as well as the industry's role during the COVID-19 pandemic. As one of the few sectors that maintained strong economic output during this challenging time, the mining industry has been viewed more favourably in this context.

Knowledge of energy transition minerals

Finally, a new factor introduced in the 2024 model is the awareness of the role that minerals and metals, such as vanadium and lithium, play in the energy transition. The more people understand how these commodities contribute to the transition, the higher the baseline level of acceptance of the mining industry within the broader community. This highlights important lessons for stakeholders involved in the energy transition: enhancing community understanding of the challenges and opportunities in the shift from non-renewable to renewable energy sources is crucial. The data indicate that the industry's social licence partly depends on increasing public awareness of what constitutes an energy transition mineral.



Figure 25: Pathways to social licence to operate, 2024²¹

²¹ In a path analysis, the numbers represent standardised Beta coefficients and therefore will vary in their value from +1.0 to -1.0, with scores closer to these end points reflecting stronger relationships than scores that are closer to 0.



Discussion and conclusion

The 2024 survey results underscore an important shift in public attitudes toward the mining industry in Australia, with notable changes observed over time. Trust in the industry has improved, rising from 2.8 in 2014 to 3.1 in 2024 (on a 5-point response scale), reflecting growing confidence in the industry's commitment to acting responsibly. Acceptance of mining has also seen a positive trajectory, though there remains room for further strengthening the relationship between the industry and the Australian public.

A significant development highlighted in this year's survey is the increasing awareness and importance of energy transition minerals in the energy transformation. With 66% of respondents agreeing that transitioning to renewable energy is urgent to combat climate change, and 73% recognising that critical minerals are essential for this transition, the survey demonstrates a strong public awareness of the need for increased mining activity. However, this heightened awareness comes with increased scrutiny of the environmental and social impacts of mining.

As Australia positions itself as a global leader in the extraction of critical resources, the survey reveals a nuanced public perspective: while there is strong support for mining as essential to achieving net zero emissions, considerable concern about the environmental impacts of increased mining activity, such as on water resources and ecosystems, remains prevalent. In fact, 61% agree that mining has negative environmental consequences. This duality reflects the broader tension between the urgent need for resources to drive the energy transition and the environmental and social costs associated with their extraction.

Social license to operate is a central theme, with public trust and perceptions of benefits outweighing impacts as two key drivers. Public trust in the mining industry is linked to a range of other drivers, including perception of procedural fairness – how well the industry listens to and respects community opinions, acts on concerns, and involves communities in decision-making. Trust has also been linked to governance, with increasing confidence that local communities and governments can hold the mining industry accountable.

The perceived benefits of mining outweigh the perceived impacts, and 72% agreed that mining supported Australia's future prosperity. However, from a distributional fairness perspective, just 52% of respondents believed mining communities receive a fair share of the benefits, and only 35% agreed that individuals like them receive a fair share of the benefits from mining. This gap between perceived national prosperity, community, and personal benefits from mining indicates room for improvement in ensuring that the economic advantages of mining are more equitably shared across society.

The data emphasise the importance of engaging with both community members directly affected by increased mining and those with a broader stake in the outcomes. As the industry expands into new areas, particularly those without a history of mining for new critical minerals, maintaining and enhancing public trust will require a concerted effort to ensure that the benefits of mining are equitably distributed and that environmental and social concerns are addressed. The findings suggest that a critical component of the mining industry's social licence to operate will be its ability to involve these communities in decision-making processes and to transparently communicate the role of energy transition minerals in the nation's sustainable future. However, there may be a tension between the need for increased mining to supply critical minerals for the energy transition and perceived environmental impacts of extraction. For example, 32% of respondents even indicated that Australia should reduce mining activity, even if it delays the transition to net zero emissions. This highlights the complex balancing act in mining for critical minerals and addressing climate change while minimising harm to local environments in the eyes of the public.

As Australia positions itself as a global leader in the extraction of these critical resources, the survey reveals a nuanced public perspective: while there is strong support for mining as essential to achieving net zero emissions, there is also considerable concern about the environmental impacts of increased mining activity. This duality reflects the broader tension between the urgent need for resources to drive the energy transition and the environmental and social costs associated with their extraction. The findings suggest that a critical component of the mining industry's social licence to operate will be its ability to involve these communities in decision-making processes and to transparently communicate the role of energy transition minerals in the nation's sustainable future.

In conclusion, the transition to renewable energy presents both opportunities and challenges for the mining industry in Australia. The pathway to success lies in the industry's ability to meet the conditions for acceptability highlighted in this report, particularly by fostering trust, ensuring fair distribution of benefits, and actively engaging with communities. By doing so, the mining industry can play a pivotal role in Australia's energy transition while maintaining the support and confidence of the Australian public.



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