

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- ☐ ☒ The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement
- ☒ ☐ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- ☒ ☐ The statistical test(s) used AND whether they are one- or two-sided
Only common tests should be described solely by name; describe more complex techniques in the Methods section.
- ☒ ☐ A description of all covariates tested
- ☒ ☐ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
- ☐ ☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
- ☒ ☐ For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
Give P values as exact values whenever suitable.
- ☒ ☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
- ☒ ☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
- ☒ ☐ Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection No software was used

Data analysis No custom algorithms were required

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

The datasets generated during and/or analysed during the current study are available in the University of Queensland's eSpace, <https://doi.org/10.48610/12b9a6e>

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☐ Behavioural & social sciences ☒ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Ecological, evolutionary & environmental sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	The study extracts values from 19 spatial variables at the location of 5,097 mining projects. Mining projects are grouped by resources to obtain a risk profile for each of the 29 metal commodities studied. The study uses existing data and does not generate new data.
Research sample	Mining project data including latitude and longitude were extracted from the S&P Global Market Intelligence database, which is a commercial database that gathers public disclosure data, mainly reported by project owners. The 5,097 mining projects represent all records from the database that have declared reserves and resources for the metal commodities analysed. The 19 variables are compiled from 19 publicly available global datasets from 17 different sources including the United Nations, the World Bank, the World Resources Institute, the NASA Socioeconomic Data and Applications Centre, the European Commission Joint Research Centre, Transparency International and several academic sources.
Sampling strategy	Not relevant. The mining project sample is the maximum possible sample, and its size is limited by global data availability. The number of datasets chosen for the analysis also depends on the availability of global-level data and its ability to accurately characterize the environmental, social and governance aspects analyzed. The number of datasets is not a criteria for accuracy.
Data collection	Mining project data was extracted from the S&P Global Market Intelligence directly to an Excel file using the S&P database screener and Excel add-in. Spatial datasets were downloaded directly from their online repositories. Data was collected by the first and second authors.
Timing and spatial scale	S&P database extraction was in September 2021 and datasets were extracted between September 2021 and February 2022.
Data exclusions	The mining project sample excludes projects with no declared reserves and resources on the basis that the development of these projects is uncertain. Our global sample of mining projects is selected to be representative of the future global supply of energy transition metals. The same exclusion criteria was used in previous publications (Valenta et al. 2019, Lebre et al. 2020). This study twice excludes projects for sensitivity analysis. 1) Sensitivity analysis for Permitting, Consultation and Consent measures. We use ordinary least squares (OLS) regression model and the robust regression model (M estimation method) to test stability of each dimension. The test excludes 517 projects without values, and total 4580 projects are included (Supplementary Table 12 & 13). 2) Sensitivity analysis for Local and National Contextual Factors measures. We use ordinary least squares (OLS) regression model and the robust regression model (M estimation method) to test stability of each dimension. The test excludes 328 projects without values, and total 4769 projects are included (Supplementary Table 14 & 15).
Reproducibility	Not relevant. The study can be reproduced using the same existing data collected by the authors and following the same methodological steps detailed in the Method section and in the supplementary information. The study does not generate new data.
Randomization	The method selected for the sensitivity analysis did not require randomization. Two sets of robustness tests (ordinary least squares regression model and the robust regression model [M estimation method]) were used to confirm the stability of the dataset generated by different measures and thresholds and is described in the supplementary information.
Blinding	Blinding is not relevant to the study because it does not involve any participant and does not rely on possible differential treatment or assessments of outcomes.
Did the study involve field work?	☐ Yes ☒ No

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

- | | |
|-------------------------------------|--|
| n/a | Involved in the study |
| ☒ | ☐ Antibodies |
| ☒ | ☐ Eukaryotic cell lines |
| ☒ | ☐ Palaeontology and archaeology |
| ☒ | ☐ Animals and other organisms |
| ☒ | ☐ Human research participants |
| ☒ | ☐ Clinical data |
| ☒ | ☐ Dual use research of concern |

Methods

- | | |
|-------------------------------------|---|
| n/a | Involved in the study |
| ☒ | ☐ ChIP-seq |
| ☒ | ☐ Flow cytometry |
| ☒ | ☐ MRI-based neuroimaging |