Mining & Climate Justice Case Studies Module

Instructor Guide

Learning Objectives:

- Recognize how current mining practices affects climate justice issues
- Understand the role and impacts of mining in different capacities
- Examine community roles and energy demands
- Discover solutions to current mining issues

The module is divided into 5 sections following the introductory material: Mining & Economy (slide 10-12)/Mining & Community (slide 13-15)/Mining & Sustainability (slide 16-18)/Mining & Renewable Energy (slide 19-21)/Beyond the Module (slide 22-24)

Key Resources: Scott Odell Publications/The True Cost of The Lithium Mining Boom Powering Electric Cars

Activities Included:

1) Slide 8: Watch & Discuss – "The True Cost of The Lithium Mining Boom Powering Electric Cars" (Insider News)

a) Prior to the video ask students: Where is the photo from? What are these pools? Where is lithium mined?

b) Students watch the 15 minute video in-class which outlines lithium mining specifically in Latin America, focused on Chile & Bolivia

i)recommended to adjust playback speed to at least 1.5x and enable subtitles

c) After watching, students can answer the questions in small groups and share answers with the class

i)Recommend displaying questions prior to playing the video

2) Slide 11: Read & Discuss – "How Can U.S. Safely Mine Minerals Critical to a Carbon-Free Economy?"

a) Prior to reading, ask students to *answer the title question* to measure knowledge before and after the activity.

b) Read the introduction as a group then divide the class into 6 groups in correspondence /w each article

c) After reading, students can discuss their group's questions and share with the class

i)Recommend displaying questions as students read

3) Slide 14: Read & Discuss – Hydrosocial Displacements (MIT)

a) Prior to reading, ask students to *define hydrosocial conflict and identify examples*

b) Students read the brief which functions as a country-specific case study

c) After reading, students answer discussion questions as a class

i)Recommend displaying questions as students read

4) Slide 17: Read & Discuss – "Mining our green future" (Nature), MIT Engineers: "Energy-storing concrete…" (NewScientist), & MIT Mission 2016: Green Mining

a) Students read the three articles and discuss the prompts on the slide and connect the articles using the prompt on slide 18

5) Slide 20: Read & Propose – "How does the environmental impact of mining for clean energy metals compare to mining for coal, oil, and gas?" (MIT Climate Portal)

a) Student read the brief article

b) After reading, students split up students to propose solutions to the three suggestion on the following slide

6) Slide 21: Beyond the Module

a) Students can create a project!

Suggestions for Future Learning:

After completing the module, ask students to reflect on the different aspects of the content and why the framework is applicable in their own field

- Utilize local and global case studies, especially from local new sources to address topics that may not be addressed in the mainstream and allows students to point out similar occurrences in different areas
- Provide the opportunity for students to share climate justice issues in their own hometown, as they can always be relevant to class topics

Additional Resources:

- Listed on slide 23

References

Aaron Kroll. (2022, December 1). *Mining for the clean energy transition*. MIT News | Massachusetts Institute of Technology. https://news.mit.edu/2022/mining-clean-energy-transition-1201

The All We Can Save Project. (n.d.). *Assignments to spark action*. The All We Can Save Project. https://www.allwecansave.earth/assignments-to-spark-action

Crawford, I., & Odell, S. (n.d.). *Will mining the resources needed for clean energy cause problems for the environment?*. MIT Climate Portal. https://climate.mit.edu/ask-mit/will-mining-resources-needed-clean-energy-cause-problems-environment

DW Documentary. (2023, July 19). *The cobalt challenge - the dark side of the energy transition | DW documentary*. YouTube. https://www.youtube.com/watch?v=0Q2IW7UEclI+https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv

Ferreira, F., & Odell, S. (n.d.). *How does the environmental impact of mining for clean energy metals compare to mining for coal, oil and gas?*. MIT Climate Portal. https://climate.mit.edu/ask-mit/how-does-environmental-impact-mining-clean-energy-metals-compare-mining-coal-oil-and-gas

Green European Foundation. (2021, August 16). *Metals and climate justice - mining our way into a climate-neutral future*. YouTube. https://www.youtube.com/watch?v=6lHLaM2FFQ4

Gregory. (2001). A concise history of mining (Rev. ed.). A.A. Balkema.

Herrington, R. (2021). Mining our green future. *Nature Reviews Materials*, *6*(6), 456–458. https://doi.org/10.1038/s41578-021-00325-9

Hsu, J. (2023, August 9). *Energy-storing concrete could form foundations for solar-powered homes*. New Scientist. https://www.newscientist.com/article/2385500-energy-storing-concrete-could-form-foundations-for-solar-powered-homes/

Iea. (2021). *Mineral requirements for Clean Energy Transitions – the role of critical minerals in Clean Energy Transitions – analysis*. IEA. https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/mineral-requirements-for-clean-energy-transitions

Insider News. (2023, July 13). *Are lithium batteries for electric vehicles costing the Earth? | true cost | insider news*. YouTube. https://www.youtube.com/watch?v=nl0E-UhKB5E

J. Willard Marriott Library and the Utah Museum of Fine Arts. (n.d.). *Mining the west: Primary elements*. Health and Environmental Effects · Mining the West: Primary Elements · J. Willard Marriott Library Exhibits. https://exhibits.lib.utah.edu/s/mining-the-west/page/health-environmental

MIT. (2016). *Environmental Risks of Mining*. Environmental risks of mining. https://web.mit.edu/12.000/www/m2016/finalwebsite/problems/mining.html

MIT. (2016). *Environmentally Sensitive "Green" Mining*. Green Mining. https://web.mit.edu/12.000/www/m2016/finalwebsite/solutions/greenmining.html

National Geographic. (n.d.). *Mining*. Education. https://education.nationalgeographic.org/resource/mining

NMA. (n.d.). *40 common minerals and their uses - national mining association*. NMA. https://www.nma.org/wp-content/uploads/2016/09/NMA-Fact-Sheet-40-Minerals-and-Uses.pdf

Odell, S. D. (2021). Hydrosocial displacements: Climate Change and Community Relations in Chile's Mining Regions. *MIT-ESI Mining, Environment & Society Program*, 102305. https://doi.org/https://environmentalsolutions.mit.edu/wp-content/uploads/2021/09/Hydrosocial-Displacements-White-Paper.pdf

Odell, S. D., & Bebbington, A. (2023). Mine ownership and Community Relations: Comparing hydrosocial dynamics of public and private companies in Chile. *Resources Policy*, *81*, 103380. https://doi.org/10.1016/j.resourpol.2023.103380

Porter, G., & Guo, Y. (2022). *CSE 291 / The Environmental Impact of Modern Computing / Spring 2022*. CSE 291 F00 - Spring 2022/classes/sp22/cse291-f/. https://cseweb.ucsd.edu/classes/sp22/cse291-f/

The Documentary Channel. (2019, August 23). *Blame game - e waste in Africa and solutions (documentary)*. YouTube. https://www.youtube.com/watch?v=mrCcTiSL_Hg

The Environmental Forum®. (2023, May). How can U.S. safely mine minerals critical to a carbon-free economy? L. Environmental Law Institute®. https://www.eli.org/sites/default/files/files-pdf/TheDebate-May-June-2023.pdf

Sanzana Calvet, M., & Castán Broto, V. (2020). Sacrifice zones and the construction of Urban Energy Landscapes in Concepción, Chile. *Journal of Political Ecology*, *27*(1). https://doi.org/10.2458/v27i1.23059