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A Just Transition for Africa: Mining for Climate Change Mitigation
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To avoid the worst effects of climate change, governments and corporations must embark on an ambitious transition away from fossil fuel-based energy sources as soon as possible. At the same time, many voices have argued that a successful energy transition will not just mitigate greenhouse gas emissions; it will also create jobs, minimize economic exclusion, and provide the basis for shared prosperity. This is the conventional meaning of the term 'just transition.'[1] While the idea of a just transition continues to play a significant role in policy debates, these conversations have largely neglected the fact that a green energy transition in the Global North will require vast mineral resources from the Global South as new technologies are deployed at scale.[2] This prospective increase in mineral production is likely to bring with it social and ecological devastation on a grand scale if mining is scaled up using a business-as-usual approach. That outcome would be unacceptable. Climate justice, and particularly a just transition, cannot be achieved without justice in mining.

Without a bold and immediate reduction of greenhouse gas emissions on the part of wealthier nations, people and communities in Africa will suffer. In fact, people and communities in Africa already are suffering. The United Nations Intergovernmental Panel on Climate Change (IPCC) reports that the continent has "already experienced widespread loss and damage attributable to anthropogenic climate change, including biodiversity loss, water shortages, reduced food production, loss of lives, and reduced economic growth."[3] The fact that African countries have only contributed around 3% of historical CO_2 emissions[4] adds moral urgency to this crisis: Africa has done little to cause climate change, but is highly vulnerable to it. Thus, it is incumbent upon wealthy, high-emitting nations to reduce their greenhouse gas emissions immediately. Achieving the Paris goal of limiting long-term climate warming to 1.5 °C remains possible, but "is implausible without urgent and ambitious action at all scales."[5]

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[1] Darren McCauley and Raphael Heffron, "Just Transition: Integrating Climate, Energy and Environmental Justice," *Energy Policy* 119 (August 1, 2018): 1–7, https://doi.org/10.1016/j.enpol.2018.04.014.

[2] But for exceptions, see Roopali Phadke, "Climate-Smart Mining: A Conference Report on the World Bank's Facility Launch," *The Extractive Industries and Society* 6, no. 4 (November 1, 2019): 1373–75, https://doi.org/10.1016/j.exis.2019.10.004; Raphael J Heffron, "The Role of Justice in Developing Critical Minerals," *The Extractive Industries and Society* 7, no. 3 (July 2020): 855–63, https://doi.org/10.1016/j.exis.2020.06.018; Jewellord Nem Singh, "Mining Our Way out of the Climate Change Conundrum? The Power of a Social Justice Perspective," Latin America's Environmental Policies in Global Perspective (Washington, D.C.: Wilson Center, October 2021), https://www.wilsoncenter.org/publication/mining-our-way-out-climate-change-conundrum-power-social-justice-perspective; Andy Whitmore, "A Material Transition: Exploring Supply and Demand Solutions for Renewable Energy Minerals" (London: War on Want, March 2021), https://waronwant.org/sites/default/files/2021-03/A%20Material%20Transition_report_War%20on%20Want.pdf.

[3] Christopher H. Trisos et al., "Africa," in *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, ed. Hans-Otto Pörtner et al. (Cambridge: Cambridge University Press, 2022), 4, https://www.ipcc.ch/report/ar6/wg2/.

[4] Hannah Ritchie, "Who Has Contributed Most to Global CO2 Emissions?," *Our World in Data* (blog), October 1, 2019, https://ourworldindata.org/contributed-most-global-co2.

[5] Minal Pathak et al., "Technical Summary," in *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. Priyadarshi R. Shukla et al. (Cambridge: Cambridge University Press, 2022), 5, https://doi.org/10.1017/9781009157926.002.

A global transition to green energy will require vast amounts of minerals such as graphite, lithium, and cobalt, large portions of which will be mined in African countries and, potentially, in waters adjacent to Africa's coasts. A World Bank report analyzing 17 minerals found that even an insufficient energy transition—one that would limit warming to 2 °C—would likely cause current mineral demand to quadruple by midcentury.[6] Large deposits of the most important minerals for the energy transition are found in Africa. The Democratic Republic of the Congo, for example, is responsible for over 70% of the world's cobalt production and home to almost half of global reserves. Significant cobalt deposits are also located over the border in Zambia.[7] In Zimbabwe, production of lithium nearly tripled between 2020 and 2021, rising from 417 to 1,200 metric tons in the space of a year.[8] Other African countries with significant lithium resources include D.R. Congo (3 million tons), Mali (700,000 tons), Ghana (130,000), and Namibia (50,000 tons).[9] Africa also plays an increasingly important role in graphite production: in 2021, large graphite deposits were under development in Madagascar, northern Mozambique, Namibia, and south-central Tanzania.[10] Significant mineral deposits are also present in the Atlantic and Indian ocean basins, often many times larger than identified terrestrial reserves.[11] The International Seabed Authority has granted 31 exploration contracts for deep-sea mining, including eight in waters adjacent to Africa's coastline, none of which are held by African states or corporations.[12] Commercial mining of the deep sea is set to begin in July 2023 unless civil society efforts to impose a precautionary moratorium succeed.[13]

The global transition to green energy will not meet the demands of justice unless prevailing models of resource extraction are uprooted and replaced with more inclusive and sustainable alternatives. While Africa's rich natural resources should be the source of shared wealth and prosperity, colonial models of resource extraction endure, resulting in human rights abuses, ecological degradation, and poor governance in many resource-rich countries. Scaling up these models would be a disastrous way to meet rising materials demand in a decarbonizing economy. An Amnesty International report on artisanal cobalt mining in Kolwezi, Kambove, Likasi, and Lubumbashi, all located in the former Katanga Province of the Democratic Republic of the Congo, found rampant human rights abuses on the part of multinational corporations and corrupt government officials, including child labor, dangerous working conditions, and physical insecurity.[14] The situation for formal laborers is

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[6] Kirsten Hund et al., "Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition" (Washington, DC: The World Bank, 2020), https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf.

[7] U.S. Geological Survey, "Mineral Commodity Summaries 2022" (U.S. Geological Survey, 2022), 53, https://doi.org/10.3133/mcs2022.

[8] U.S. Geological Survey, 101.

[9] U.S. Geological Survey, 101.

[10] U.S. Geological Survey, 74, 75.

[11] James R. Hein et al., "Deep-Ocean Mineral Deposits as a Source of Critical Metals for High- and Green-Technology Applications: Comparison with Land-Based Resources," *Ore Geology Reviews* 51 (June 1, 2013): 1–14, https://doi.org/10.1016/j.oregeorev.2012.12.001.

[12] International Seabed Authority, "Contractors for Seabed Exploration" (International Seabed Authority, April 2018), https://isa.org.jm/files/files/documents/isacont-update.pdf.

[13] Kate Lyons, "Deep-Sea Mining Could Start in Two Years after Pacific Nation of Nauru Gives UN Ultimatum," *The Guardian*, June 30, 2021, sec. World news, https://www.theguardian.com/world/2021/jun/30/deep-sea-mining-could-start-in-two-years-after-pacific-nation-of-nauru-gives-un-ultimatum.

[14] Amnesty International, "'This Is What We Die For': Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade in Cobalt" (London: Amnesty International, 2016), https://www.amnesty.org/en/documents/afr62/3183/2016/en/.

not much better. An article in *The New Yorker* describes one instance of abuse, captured on a cellphone video, in which

> *a Congolese guard with a Kalashnikov slung across his back beats a man who is lying, semi-naked, in mud, his arms bound. Behind the camera, a man otherwise speaking Mandarin starts yelling "Piga! "—the Kiswahili word for "beat." In the background are seven of the trucks that Congo Dongfang [a Chinese mining company] uses to transport cobalt ore.*[15]

The environmental costs of mining are also significant. In some areas near Kolwezi, for example, activities related to mining have so polluted water and soil resources that crops no longer grow, forcing people to seek the only non-agricultural employment available—day labor in the mines.[16] In addition to the direct impacts poorly managed mining operations have on local ecosystems and livelihoods, they can also have much more widespread effects by causing unplanned migration and urbanization and through conflicts with logging, hydrocarbon, and conservation allotments. According to a report from the World Bank, "this scenario carries with it the potential for large-scale deforestation and forest degradation" in the Congo Basin,[17] which is home to the second-largest tropical forest in the world, around one-quarter of above-ground tropical forest carbon stocks,[18] and a roughly equal amount of carbon stored belowground in the world's largest peatland complex.[19] An increase in deforestation and degradation caused by the expansion of industrial mining would be disastrous for climate change, biodiversity, and livelihoods. It would also undermine climate resilience. The nascent deep-sea mining industry presents similar issues. Despite persistent knowledge gaps, many in the science and conservation communities fear that large-scale mining of the deep sea will lead to widespread extinctions of the organisms specialized for these sensitive habitats, and that it may also damage oceanic food webs,[20] which are crucial for the economies, cultures, and livelihoods of many coastal regions in Africa. This is why the IUCN World Conservation Congress passed a motion at its 2021 meeting calling on all member states to support a precautionary moratorium on the activity.[21]

The worst-case scenario—and a very plausible one—would be for the world's wealthy, high-emitting countries to transition to green energy at a scale and pace insufficient for limiting climate warming to 1.5 °C, but still sufficient to damage communities and ecosystems in Africa, thus worsening climate impacts while also undermining the capacity of communities and countries to adapt to their effects. This result must be avoided by:

- Documenting the social and environmental destruction caused by mineral supply chains.

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[15] Nicolas Niarchos, "The Dark Side of Congo's Cobalt Rush," *The New Yorker*, May 24, 2021, https://www.newyorker.com/magazine/2021/05/31/the-dark-side-of-congos-cobalt-rush.

[16] Niarchos.

[17] Kirsten Hund et al., "Mining," Deforestation Trends in the Congo Basin: Reconciling Economic Growth and Forest Protection (Washington, D.C.: World Bank, April 2013), 24, http://hdl.handle.net/10986/16617.

[18] Sassan S. Saatchi et al., "Benchmark Map of Forest Carbon Stocks in Tropical Regions across Three Continents," *Proceedings of the National Academy of Sciences* 108, no. 24 (June 14, 2011): 9899–9904, https://doi.org/10.1073/pnas.1019576108.

[19] Greta C. Dargie et al., "Age, Extent and Carbon Storage of the Central Congo Basin Peatland Complex," *Nature* 542, no. 7639 (February 2017): 86–90, https://doi.org/10.1038/nature21048.

[20] Luc Cuyvers et al., *Deep Seabed Mining: A Rising Environmental Challenge* (Gland, Switzerland: IUCN and Gallifrey Foundation, 2018), https://doi.org/10.2305/IUCN.CH.2018.16.en.

[21] IUCN World Conservation Congress, Protection of Deep-Ocean Ecosystems and Biodiversity Through a Moratorium on Seabed Mining, Motion 069 (Sep. 22, 2021). https://www.iucncongress2020.org/motion/069

- Holding countries and corporations accountable for their violations of international ethical norms.
- Advocating for a just transition to green energy that achieves the goals of the Paris Agreement while supporting sustainable development, climate resilience, and shared prosperity in the Global South.