

# New research exposes extent of mineral demand for renewable energy technologies

April 18 2019

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The growing demand for minerals and metals to build the electric vehicles, solar arrays, wind turbines and other renewable energy infrastructure necessary to meet the ambitious goals of the Paris Climate

Agreement could outstrip current production rates for key metals by as early as 2022, according to new research by the UTS Institute for Sustainable Futures.

The study, commissioned and funded by U.S. non-profit organisation EarthWorks, shows that as demand for minerals such as lithium and rare earths skyrockets, the already significant environmental and human impacts of hardrock mining are likely to rise steeply as well. In a companion white paper, Earthworks makes the case for a broad shift in the [clean technologies](#) sector towards more responsible minerals sourcing.

"We have an opportunity, if we act now, to ensure that our emerging [clean energy](#) economy is truly clean – as well as just and equitable – and not dependent on dirty mining," said Payal Sampat, Earthworks Mining Director. "As we scale up clean energy technologies in pursuit of our necessarily ambitious climate goals, we must protect community health, water, human rights and the environment."

"The responsible materials transition will need to be scaled up just as ambitiously as the 100 percent [renewable energy](#) transition," said Dr Sven Teske, Research Director at the UTS Institute for Sustainable Futures.

Doing so will require a concerted commitment from businesses and governments, according to the report's lead author Elsa Dominish, Senior Research Consultant at the UTS Institute for Sustainable Futures. "We must dramatically scale up the use of recycled minerals, use materials far more efficiently, require mining operations to adhere to stringent, independent environmental and human rights standards, and prioritise investments in electric-powered public transit.

"The renewable energy transition will only be sustainable if it ensures

human rights for the communities where the mining to supply renewable energy and battery technologies takes place. If manufacturers commit to responsible sourcing this will encourage more mines to engage in responsible practices and certification. There is also an urgent need to invest in recycling and reuse schemes to ensure the valuable metals used in these technologies are recovered, so only what is necessary is mined," Ms Dominish said.

### Research highlights:

- Under a 100 percent renewable energy scenario, metal requirements could rise dramatically, requiring new primary and recycled sources
- Clean technologies rely on a variety of minerals, principally cobalt, nickel, lithium, copper, aluminum, silver and rare earths. Cobalt, lithium and rare earths are the metals of most concern for increasing demand and supply risks
- Batteries for electric vehicles are the most significant driver of accelerated minerals demand.
- Recycled sources can significantly reduce primary demand, but new mining is likely to take place and new mining developments linked to renewable energy are already underway
- Responsible sourcing is needed when supply cannot be met by recycled sources

Minerals extraction already exacts significant costs on people and the environment, fuelling conflict and [human rights](#) violations, massive water pollution and wildlife and forest destruction. Most of the world's cobalt, used in rechargeable batteries for [electric vehicles](#) and phones, is mined in the Democratic Republic of Congo, often by hand in unsafe conditions using child labor. Earlier this year in Brazil, the collapse of two tailings dams at Vale's Brumadinho iron ore mine killed hundreds of workers and local residents. Independent research that analyses decades

of data on mine waste dam failures reveals that these catastrophic failures are occurring more frequently and are predicted to continue to increase in frequency.

"In Norway, the government tell us we have to sacrifice our fjords to mine copper for clean energy," said Silje Karine Muotka, a member of the Saami Parliament, which is fighting a mine proposal in their traditional reindeer herding grounds. "I recognise that we need materials for new technologies, but we should look for ways to get them that do not harm the environment or threaten native culture."

"Solar and wind production is growing rapidly, while the cost of [clean energy technologies](#) has continued to fall," said Danny Kennedy, Managing Director at the California Clean Energy Fund. "If the clean tech revolution has taught us anything, it is that humanity possesses boundless capacity for innovation. Our task is to establish the parameters within which innovators can innovate to ensure that clean energy is truly clean."

Earthworks commissioned the ISF research as part of its newly-launched 'Making Clean Energy Clean, Just & Equitable' initiative, which aims to ensure that the transition to renewable [energy](#) is powered by responsibly and equitably sourced minerals, minimizing dependence on new extraction and moving the mining industry toward more responsible practices.

**More information:** Responsible minerals sourcing for renewable energy. [www.uts.edu.au/research-and-te ... for-renewable-energy](http://www.uts.edu.au/research-and-te...for-renewable-energy)

Provided by University of Technology, Sydney

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