

The Darker Side of the EV Revolution. Toxic Batteries, Nickel and Hexavalent Chromium

Electric cars are not made from angel breath and sunshine. Environmental harm must be minimized as the EV revolution moves forward.

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As the [EV revolution](#) picks up speed, electric car advocates like to emphasize that electric cars do not leave carbon dioxide emissions in their wake. Nor do they spew nitrogen oxide pollution or fine particulate matter from exhaust pipes. (Note: All tires shed some particulates as they wear and EVs, being somewhat heavier than equivalent conventional cars, may leave more tire bits behind, but the particulates most damaging to human health are the ones created when fossil fuels are burned. By definition, electric cars add none of those to the air we breathe.)

Yet as much as we welcome the [EV revolution](#), **we cannot ignore that manufacturing and the supply chains that make it possible all have environmental impacts** that degrade the world we live in. In particular, mining — which gives us the raw materials we need to make aluminum, iron, copper, platinum, nickel, and manganese, among others — often involves excavating huge quantities of mineral deposits that are then processed to make the end products used in manufacturing.

Nickel & Hexavalent Chromium

We are all familiar with the reports of child labor abuse associated with mining cobalt in the DRC. Those reports are so serious that there is a major push to reduce or eliminate the use of cobalt in lithium-ion batteries. But one way to reduce the amount of cobalt is to increase the amount of nickel. Most EV drivers have no idea where the nickel in their batteries comes from. According to [The Guardian](#), one principal source is tiny Obi Island, one of the 17,508 islands in Indonesia.

Getting there is not easy. It requires a 3 1/2 hour flight from Jakarta, followed by an overnight ferry trip, and finally a 2-hour journey by boat to arrive at Kawasi, a village of

4,000 people near one of the largest nickel mines in Indonesia. The \$1 billion site where the mine is located is owned by the Indonesia-based Harita Group and China's Lygend Mining. Chinese battery component producer GEM, which supplies battery components to many of the world's leading battery manufacturers, has signed an agreement to purchase nickel from the company, PT Halmahera Persada Lygend.

But people in Kawasi say they are afraid because of the pollution created by the mine. [The Guardian](#) reports there were 900 reported cases of acute respiratory infections in 2020 — half of them in children age 4 and younger. According to Indonesian health officials, the incidence of such infections in Kawasi was just under 20% in 2020, compared with a national average of 9%.

"The difference [since the mining started] is enormous. The beach was still clean, the sea was not muddy like this and not red yet. People still fished in front of their houses," says a nurse who has lived in the village since 2009, before the mine started operating. "The trend of [higher] ARI cases began at the same time as [mining] exploration also began." A woman who lives in the village says, "I keep thinking: is there any future for the children?"

The Guardian took water samples from the source of drinking water for the village and had it tested at a government certified laboratory. **The results showed the level of hexavalent chromium — Cr6 — was 60 parts per billion.** The Indonesian government has set the maximum allowable at 50 ppb. Cr6 can cause liver damage, reproductive problems and developmental harm when ingested or inhaled. Long-term exposure through drinking water has also been linked to stomach cancer. It is the same carcinogen that figured prominently in the [Erin Brockovich lawsuit](#) against PG&E that resulted in one of the largest legal settlements in US history in 1996.

The Company Responds

Not surprisingly, the mining company says its own tests show an acceptable level of Cr6 in the local drinking water. It claims the carcinogen is common in tropical areas and its operations have not contributed to its presence. It says it tested the spring water near Kawasi from 2013 to 2021. Those tests showed that it met the water quality standards set by the government, with Cr6 registering in the range of 5 to 40 ppb. It said its tests had showed there was no Cr6 discharge from its system or impact on the water quality of the Kawasi springs.

Halmahera Persada Lygend said that the positive and negative impacts of its projects had been assessed in an environmental impact analysis, which has been reviewed and approved by the government. It also said provincial and district environmental offices regularly conducted site inspections to review company operations and take samples for analysis if needed.

Booming nickel prices and a "battery arms race" have seen a rush to develop mines but there are fears that regulatory oversight has failed to keep up with the pace of development. "They [the Indonesian government] are trying to remove red tape to make the industry more attractive for investment, but without proper environmental assessments, it could be risky given the way the industry is heading," says Indonesian nickel mining expert Steven Brown.

Matthew Baird, an environmental lawyer based in southeast Asia, tells *The Guardian* that holding mining companies and the supply chain accountable for pollution is difficult, especially when there could be multiple sources for the contamination. “These big mining operations are very much in areas that are very inaccessible and where they are operating as a *de facto* local government ‘company town’,” he says. “Mining companies may blame other problems and that all may be correct, but because they are there, there is a likelihood they are contributing to the problem.”

Many readers will recall how fracking companies like to point fingers in several different directions to deflect blame from themselves for earthquakes, polluted groundwater, and exploding tap water. It’s the same playbook invented by the tobacco industry. “You can’t prove which puff of smoke or which particular cigarette caused your lung cancer, so you can’t hold us responsible.” If no one is accountable, then anything goes. For those who may be swayed by such denials, take a moment to look at the photos of the rusty red river that flows near the mining operations featured in *The Guardian* article and ask yourself if you would drink it or allow your children to swim in it.

The EV Revolution

Manufacturers invest a lot of time and effort making sure the companies that are part of their supply chain adhere to their environmental standards. When contacted by *The Guardian*, Mercedes-Benz said it took the allegations seriously and was immediately contacting its direct supplier to clarify the issues raised, even though it does not buy nickel directly.

Manufacturing is a dirty business. Factories require land to be cleared, iron, steel, and concrete to be assembled, electrical power to make all the machinery function, and often thousands of miles of transportation emission to get raw materials to the factory and finished products on to consumers.

The message for the [EV Revolution](#) is this — if we seek to hold ourselves to a higher standard, we must hold *all those involved* to a higher standard as well. We often talk about [untaxed externalities](#) that allow fossil fuel companies to thrive. We must ensure we do not turn a blind eye to similar untaxed externalities when they occur in EV manufacturing.

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Steve Hanley writes about the interface between technology and sustainability from his home in Florida or anywhere else The Force may lead him. He is proud to be “woke” and doesn’t really give a damn why the glass broke. He believes passionately in what Socrates said 3000 years ago: “The secret to change is to focus all of your energy not on fighting the old but on building the new.”

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