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# Electric vehicles trigger search for lithium and cobalt

By **Chris Tomlinson** | September 26, 2017 | Updated: September 27, 2017 11:46am

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Photo: Gwenn Dubourthoumieu

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**IMAGE 1 OF 8**

The T17 mine is run by KML, a subsidiary of Glencore in Kolwezi. Between August, 2010, and February, 2011, more than 10,000 artisan miners were chased away from the sites when the company took over the area.

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Automakers this summer touted plans to offer more electric vehicles, with Mercedes-Benz announcing it will spend \$1 billion to add a battery factory to its plant in Tuscaloosa, Ala.

Ford is investing \$4.5 billion in electric vehicle production, Volkswagen has promised 30 electrified models, and Volvo plans to go all electric or hybrid by 2019. Even Porsche will offer a battery-powered sports sedan called Mission E in 2020.

Automakers expect to sell 20 million all-electric vehicles in 2030, according to conservative estimates, prompting questions about where the raw materials will come from to make all of those batteries.

Thinking about battery demand requires a new vocabulary. When it comes to liquid fuels, we talk about millions of barrels of crude oil. Battery demand is measured in gigawatt-hours of storage capacity.

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Demand for electric vehicle batteries is expected to grow from 15.9 gigawatt-hours in 2015 to 93.1 gigawatt-hours by 2024, according to Navigant Research, a consulting firm specializing in energy technology.

The critical elements in lithium ion batteries, the most commonly used, include graphite, cobalt, nickel, manganese and lithium, of course. The hardest to get, and therefore the most

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**TRANSLATOR**

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**CHRIS TOMLINSON**

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valuable, are cobalt, lithium and graphite.

Cobalt is the industry's weakest link. About 65 percent comes from the Democratic Republic of the Congo, which I can say from personal reporting, has some of the most dangerous and environmentally destructive mines on the planet, often worked by children. Most Congolese authorities are deeply corrupt, and civil war is a significant risk in mining regions.

Western companies worry human rights activists will start talking about "blood cobalt," which is why Tesla has said it wants all raw materials sourced in North America.



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Volkswagen has asked mining companies to submit proposals for supplying the company with a 10-year cobalt supply beginning in 2019, the Reuters news agency reported last week. The German automaker, desperate to reinvent its image after cheating on emission

tests, needs 150 gigawatt-hours of battery capacity annually by 2025 and wants to do so responsibly.

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Cobalt is only rare, though, because mining companies have historically produced it as a byproduct of silver and copper mines.

"People are focused on the DRC and the risk there, which is real. But five or 10 years out, we're going to see new cobalt production outside the DRC," said Trent Mell, president and CEO of Canadian mining firm First Cobalt Corp. "People are forgetting that miners have never been paid to look for cobalt for cobalt's sake."

Mell abandoned plans to invest in the Democratic Republic of the Congo two weeks ago because investors don't want to get caught up in Congo's problems. The company will instead focus on a former silver mine near Cobalt, Ontario, named from the region's high-grade veins. Mell said there are over 100 mines that were abandoned in the last century because they produced nickel and cobalt when miners only wanted silver.

"Across Canada, the U.S., Chile and Scandinavia, you're going to see new discoveries and new production," Mell predicted.

About 75 percent of the world's lithium comes from Argentina, Chile and Bolivia, an area known as the lithium triangle. Demand is growing between 12 percent and 15 percent a year, with the price more than doubling between 2015 and 2017, according to Benchmark Mineral Intelligence.

That price jump is encouraging innovation. Scientists have come up with new ways to extract lithium faster and cheaper, according to the International Lithium Corp., an exploration and production company.

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The company teamed up with Irving-based Pioneer Resources to drill for lithium at its Mavis Lake Lithium Project in Ontario. The company has also successfully tested a new filtration system at a lithium-potash brine project in Argentina.

China produces about 65 percent of the world's supply of graphite, an advantage the government has used to boost battery manufacturing rather than exporting the mineral.

The expected increase in demand for graphite, from 80,000 tons in 2015 to at least 250,000 tons by the end of 2020, has sent miners looking for new sources. London-based Armadale Capital reported finding high-grade graphite last year near a gold mine in Tanzania. Exploratory drilling in South Australia's Eyre Peninsula has also proven large reserves there.

"I think people in the tech space may not realize how responsive miners can be to fill that gap," Mell said. "Just watch us, because there is a lot out there."

Wherever there is a chance to turn a profit, there will be innovation. Tesla and other battery manufacturers are also working on lowering costs and figuring out how to recycle old



batteries. Scientists are developing alternative battery technologies.

As every good business person knows, every problem is an opportunity.

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