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DRIVING DISRUPTIONS IN THE METALS MARKETS

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China recently joined the UK and France in announcing plans to ban the sale of vehicles that run exclusively on gasoline or diesel fuel, further sparking a potential revolution in electric vehicles (EVs). However, this is not just an auto or energy story. It will also create winners and losers for certain basic materials names as price volatility of the underlying commodities increases. In addition, companies will need to make difficult capital allocation decisions with less-than-certain estimates of EV penetration rates. Changing battery technology must also be factored into investment decisions as improvements to the cathode material are necessary to make EVs competitive with internal combustion engines (ICEs).

Exhibit 1 illustrates the magnitude of EV-driven demand growth for certain metals if EVs reach 41 million units by 2040, which is estimated to account for 34% of total global vehicle sales. These are relatively conservative projections, with some estimates suggesting penetration rates as high as 50-55% by 2040.

Exhibit 1: Global Electric Vehicle Metals Intensity

Metals Demand (Metric tons, in thousands)	2017E	2020E	2025E	2030E	2035E	2040E
Aluminum	151	393	1,376	4,215	6,483	8,188
Cobalt	3	11	38	126	195	246
Copper	42	131	459	1,265	1,945	2,661
Graphite	17	66	229	632	973	1,228
Lithium	7	17	76	211	324	409
Nickel	17	44	153	422	648	819
Zinc	8	26	92	316	486	614
Global EV Sales (mm units)	0.8	2.2	7.6	21.1	32.4	40.9
Global EV Sales (% of Total Vehicle Sales)	1%	3%	8%	20%	29%	34%

Source: Aegon Asset Management US, Bloomberg Intelligence, Bloomberg New Energy Finance, US Geological Survey, Bloomberg News

The projections used in Exhibit 1 translate into an approximate 20% compound annual growth rate in EV end-market demand for each of these metals through 2040. However, the demand for each metal from EVs as a portion of total demand of the metal differs significantly for each, implying different outcomes for supply and demand dynamics. It is anticipated EV demand will be much more influential on prices of metals such as cobalt, graphite and lithium rather than the more widely used base metals (Exhibit 2).

The recent price volatility in cobalt and lithium highlights the step change in the EV-driven demand currently factored into the market. As supply security is an issue with cobalt, which is highly dependent on production in the Democratic Republic of Congo and China, high prices might drive substitution by new technologies. On the other hand, lithium resources are abundant but the rush to develop them will have implications on the current market structure, where Chile dominates supply.

For copper, use within the vehicle will increase in an EV relative to an ICE vehicle. There will also be incremental demand resulting from infrastructure needs such as charging stations, as well as from new copper required in the electrical grid. While EV-related demand for copper is expected to be rather modest relative to total global copper demand, the new source of demand has the potential to create a sustained acceleration of total demand growth.

On the flip side, EVs could create some demand destruction for certain metals. Lead demand is anticipated to face headwinds as the metal is used in starter batteries for ICE vehicles. In addition, prices for platinum group metals may also be pressured as approximately 40% of platinum demand and 75% of palladium demand are derived from emission control catalysts that are used in ICE vehicles.

EVs are anticipated to have a more nuanced demand effect on other commodities such as steel, aluminum and coal. Steel and aluminum will likely continue to battle it out based on their ability to meet the needs for light weight car production, which allows for longer travel distance on less power. As coal still accounts for a significant portion of the generation mix, demand may increase since more and more vehicles will be powered from the grid rather than via petrol.

For long-term investors, the overall shift from ICE vehicles to EVs, as well as the build out of the necessary charging infrastructure, has important implications for metals demand and the underlying companies that mine and produce these commodities.

Exhibit 2: Demand Impact & Effect on Large Producers

Metal/ Commodity	Demand Trend	Companies Impacted
Aluminum	▲	Alcoa, Century Aluminum, Rio Tinto, United Company RUSAL
Coal	—	Anglo American, Arch Coal, Cloud Peak Energy, Glencore, Murray Energy, Peabody Energy
Cobalt	▲	Glencore, Vale
Copper	▲	Anglo American, BHP Billiton, Codelco, First Quantum, Freeport-McMoRan, Glencore, Rio Tinto, Teck Resources, Southern Copper
Graphite	▲	SGL Carbon
Lead	▼	Glencore, Teck Resources, Vedanta
Lithium	▲	Albemarle, FMC Corp, SQM
Nickel	▲	Anglo American, BHP Billiton, Glencore, Norilsk Nickel, Vale
Platinum Group Metals	▼	Anglo American, Norilsk Nickel
Steel	—	AK Steel, Arcelor Mittal, Gerdau, Nucor, POSCO, Severstal, Tata Steel, ThyssenKrupp, US Steel
Zinc	▲	Glencore, Nyrstar, Teck Resources, Vedanta

Source: Aegon Asset Management US, company filings. References above to specific issuers should not be considered a recommendation to buy or sell such securities. Demand trend should not be interpreted as an indicator or guarantee of performance and investors should not rely on this information for investment decisions. Companies listed represent the largest producers of each metal, respectively.

Disclosure