

April 1, 2021

Dear Clients and Colleagues:

Global automobile sales decreased by 15% in 2020, amid the ongoing COVID-19 pandemic. Meanwhile, sales of battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) were more resilient to the crisis, growing by 43% to more than 3 million¹. The global market share of BEVs and PHEVs increased from 2.5% in 2019 to 4.2% in 2020, and is expected to reach 38% by 2030. The growth is attributed to tightening emission regulations, favourable government incentives, improved technology, and better affordability. Europe and China have been leading the way in EV adoption, each accounting for over 40% of global EV shipments in 2020. Germany is now the second largest market after China, with 394,943 units sold in 2020².

Tesla was the best-selling brand in 2020, delivering half a million units, up roughly a third from its 2019 results. German carmaker Volkswagen Group (VW) is still trailing Tesla for EV sales, but the gap is closing fast. VW delivered 231,600 BEVs in 2020, tripling its deliveries in 2019, and is expected to surpass Tesla to be the biggest EV maker by 2025, if not sooner. In fact, VW has already become the number one EV maker in Europe in 2020. On its first Power Day held in mid-March 2021, VW laid out its plan to expand its e-mobility business by 2030, including building six gigafactories in Europe, using unified cell technology to lower battery costs by 30-50%, and expanding its global fast-charging network. The company targets 70% of all the cars sold by VW Group to be pure electric by 2030. Many other traditional carmakers have similar targets. BMW, for example, projects that fully electric models will account for at least 50% of their global deliveries by 2030; Renault-Nissan-Mitsubishi expects half of its EU launches will be pure-electric by 2025; Honda aims for 100% of its EU auto sales to be electric by 2025. It is estimated that the number of EVs sold will rise to 30 million in 2028, and EVs will represent nearly half of all passenger cars sold globally by 2030³.

Increasing adoption of EVs also means growing demand for metals. The demand for copper, for example, is expected to increase tenfold between 2019 and 2030⁴. Copper is used throughout electric vehicles and in charging stations and supporting infrastructure, due to the metal's durability, high conductivity and efficiency. On average, an internal combustion engine (ICE) car contains 23kg of

¹ <https://www.ev-volumes.com/country/total-world-plug-in-vehicle-volumes/>

² <https://www.weforum.org/agenda/2021/02/electric-vehicle-market-global>

³ <https://www.canalys.com/newsroom/canalys-global-electric-vehicle-sales-2020>

⁴ <https://www.bloomberg.com/news/articles/2020-12-31/billionaire-friedland-s-spac-readies-funds-for-clean-power-push?srnd=green>

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copper. Conversely, a BEV takes around 83kg of copper, about three times more. On top of this, several other secular trends are also driving demand for copper, including the increased consumer use of electronics and clean energy transition. In fact, copper is used in nearly all green technologies, particularly solar PV, wind, and energy storage. Fitch Solutions forecasts a shortfall of 489,000 tons of copper in 2024, and a shortfall of 510,000 tons in 2027⁵. Recycling is an important part of the solution to meet future copper demand, as copper can be recycled as often as desired without a loss of quality. Currently, around 35% of global copper use comes from recycled copper, and this rate is expected to go higher.

Aurubis AG, one of the companies we own in our portfolios, is the largest copper producer in Europe, the second largest in the world, and one of the largest copper recyclers worldwide. The company produces over 1 million tons of copper cathodes annually, and they produce copper cathodes with a roughly 40% smaller CO₂ footprint than the global average for copper smelters. This is due to their high level of recycling and more efficient production methods.

Price, range, charge time, and charging infrastructure are among the main challenges to mainstream EV adoption. Enhancements to battery technology is the key to reducing the cost and improving EV's performance. Gentherm Inc., a global leader of thermal management technologies and a holding of Global Alpha, provides a battery thermal management system. The system improves the performance of the battery packs in hybrid electric vehicles by heating the battery during cold conditions and cooling it during warm conditions, which increases the life of a battery pack. They also have a cell connecting system to provide a reliable and continuous flow of temperature and cell voltage information during the charging and discharging process, ensuring performance and safety. Horiba Ltd., another company we own in the portfolios, provides analytics and measurement equipment. While Horiba's mainstay business is its automotive emission testing system, they also provide test and diagnostic systems for fuel cells and batteries through its subsidiary -- Horiba FuelCon. The demand for fuel cells and battery testing was very strong and Horiba FuelCon tripled its production capacity in 2020. On the other hand, the demand for emission testing will not disappear any time soon, given tightening emission regulations, and the fact that emission testing is still needed for hybrid electric vehicles.

⁵ <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/copper-supply-faces-struggle-to-keep-up-with-growing-demand-60471925>

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The increasing charging demand will put significant pressure on the aging grid, especially during peak charging hours. The smart grid is the key to support this demand. With a smart grid, utilities can predict and manage EV charging. It also enables utilities to provide consumers with greater insights into their EV experience, including better understanding the cost of charging, and helping users set optimal charging preferences. Landis+Gyr Group, a holding we talked about in the weekly commentary on May 22, 2020, is a leading global provider of smart meters and smart grid solutions. Although there are delays with regulatory project approvals and installations of smart meters due to COVID-19, the mid- to long-term growth prospect remains intact. In addition to providing smart meters, Landis is making active investment in software development to add more higher-margin and less volatile revenue streams. In December 2020, Landis signed a partnership with Google Cloud to innovate the next generation cloud-based energy management solutions, which is the first partnership of this kind for the energy management industry. With a solid balance sheet, Landis is in a good position to make investments and benefit from the global megatrend.

Have a great day.

The Global Alpha team

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