

July 22, 2016

Dear clients and colleagues,

Green, connected and intelligent. This is really, in its simplest terms, what the automotive industry is now all about. With great opportunities come big challenges for automakers and their suppliers, as so much change is set to happen in the industry over the next 10 years.

This change will impact companies in our investment universe in several sectors, from resources to technology to automotive original equipment manufacturers (OEMs).

Here are some of the key questions to be considered:

1. What does the supply chain look like between car manufacturers, OEMs, tech companies and battery manufacturers
2. What is the path to negligible environmental impact: gasoline, electricity or hydrogen
3. Will autonomous "chauffeur" vehicles replace or complement active driving
4. Will sharing cars, rather than purchasing them, become the norm in the future

Apple recently spent \$1 billion to buy a stake in Chinese ride-hailing service Didi and is widely rumored to be developing its own car. Samsung Electronics is on the verge of making a substantial investment in BYD, a Chinese manufacturer of electric cars and batteries. The list of industry crossovers is accelerating, and most concerning for car manufacturers is that large brand names are entering the market.

The Tesla/Panasonic battery gigafactory opens on July 29 with production set to commence in 2017. Expect a slow ramp up as the facility hopes to introduce new technologies that will reduce the cost of a battery. As well, battery safety regulations require extensive testing periods, especially with new technologies, which can be long and cumbersome. With low single-digit penetration, battery-operated vehicles are not predicted to gain significant market share (in the high teens) until 2022 as their performance and cost improve with time.

The recent Volkswagen diesel emissions debacle caused market disruption and has incentivized regulators to increase both emission standards and monitoring for cars and trucks. In the case of cars, the average CO₂ emissions for gasoline engines was 122.6 g/km in 2015, while the average emissions for diesel engines was 119.2 g/km. The EU's targets require automakers to limit average CO₂ emissions to 95 g/km by 2021. The EPA is following suit. Because of these stringent requirements, immediate demand for catalytic converters will be well supported. Catalytic converters, especially those for gasoline engines, have a high palladium content. Therefore the increased demand for catalytic converters should continue to drive the palladium market.

Global Alpha is exposed to this trend through a position in Stillwater Mining, the largest producer and recycler of palladium and platinum in North America. It is vertically integrated from mine to smelter and produces from two operations in Montana.

The company holds a favourable competitive position as a tier 1 cost producer. Its all-in cost for palladium is \$750 per ton versus over \$1,000 per ton for African producers.

Global Alpha is also invested in the car emission monitoring industry, a growing market over the next few years as tighter regulations come on line. Horiba, a Japan-based manufacturer of measurement equipment, specializes in the analytics and measurement of small particles in the field of environment, health, safety and

energy. Horiba, Ltd. was founded in 1945 and is headquartered in Kyoto, Japan. The company has an extensive product line of analyzers that evaluate exhaust gas and particulate emissions, engine performance and fuel economy.

According to the Aberdeen Group, 46% of the opportunity related to reducing CO2 emissions is connected to vehicle weight. Carbon fiber, which can reduce vehicle weight by 60%, will represent a stepwise improvement in the future. Today, carbon fiber is too expensive to replace steel or aluminum. However, similar to the aerospace industry, car OEMs all over the world are actively seeking lighter-thinner-stronger parts that retain current safety and comfort properties. Needless to say, the car is increasing in complexity at a rapid pace.

This complexity has given rise to market strength for savvy car OEMs that employ leading edge technology. Global Alpha is exposed to this type of company through its investment in Gentherm. The inventor of the heating and cooling car seat, Gentherm now develops and manufactures a variety of thermal management technologies for the automotive and industrial industries. Gentherm is a global leader in thermo-electric components with offices in 12 countries and over 10,000 employees.

The lifespan of automobiles continues to increase. In the US, the average lifespan of a vehicle is approximately 11.4 years, while in Europe it is 9.5 years. According to the latest Lang iReport, cars and light trucks 15 years and older will be the fastest growing vehicle age group by the end of 2019, reaching more than 11 million vehicles in operation in the US.

Global Alpha is present in the automobile aftermarket. In Australia, through Burson Auto Parts (presented a few weeks ago in its own weekly) and Motorcar Parts of America (MPAA), a company that has taken to new heights the refurbishment of car parts through a highly efficient remanufacturing process. MPAA operates facilities on a global basis and provides the highest quality replacement starters, alternators, wheel hub assemblies, bearings and master cylinders available in the aftermarket.

Have a good weekend.

The Global Alpha Team