Tech Disruption: Which Sectors Will Electric Vehicles Disrupt Most?

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Electric vehicles (EVs) will have a widespread impact on multiple industries. Disruption will be felt most in the automotive sector, albeit differently for automakers than for auto suppliers. Longer term, we also see oil and gas producers and refiners feeling the disruption, but we believe general energy savings will likely offset demand upside from EVs for power utilities. Finally, EVs can be a boost for metals and mining companies with exposure to cobalt, lithium, or copper.

Although electric vehicles are likely to have a dramatic impact on the landscapes of several industries, any rating actions are likely to be longer term in nature, and, at this point, remain subject to the actions of management teams. In addition, the effects are likely to vary greatly by region, depending on a variety of factors. Still, a focal point of ratings surveillance is ensuring that the full impact of disruption is captured. The coming years will determine which companies have best positioned themselves to compete in this changing framework.

When using the term EV, we are referring both to battery electric vehicles (BEV) and plug-in hybrids (PHEV).

Automotive

S&P Global Ratings assumes a steady rise of electric vehicle sales by 2025. Underpinning this assumption is our belief that important environmental considerations in cities, government policies more generally, and the increased competitiveness of the technology and attractiveness to consumers will support EV growth. In China, the government is targeting 20% EV penetration by 2025 under the stimulus provided by the new carbon scheme it will introduce in 2019. In Europe, we estimate that EVs, both BEVs and PHEVs, will account for about 25% of light vehicle sales by 2025 while in the U.S. the number is closer to 10%, in part reflecting a lack of political consensus on climate change arising from Washington D.C. We assume an increasing share of research and development (R&D) and capital expenditures (capex) over the coming years for global automakers to support the electrification of powertrains to meet heightening environmental standards. This will constrain the financial flexibility of automakers, and we expect some to try to manage increasing costs through partnerships with other companies. This will be critical in order to keep the vehicle transaction price at an optimum level for the end-consumers.

Trends toward electrification could have a neutral to slightly positive impact on credit quality for several large Tier-1 suppliers over the next three to five years as increased revenue mostly offsets increased engineering and R&D-related spending.

Given our expectations for ongoing technological improvement, the two most important factors that could fuel higher consumer demand for EVs, relative to our expectations, will be the extent of government subsidies and reductions in battery costs. Nevertheless, the key challenge for original equipment manufacturers (OEMs) is how deftly they can share the responsibility of developing new technologies with their suppliers without relinquishing the core value of the vehicle in

consumers' eyes. While some OEMs may still opt to manufacture electrification equipment themselves, we expect suppliers to start playing a much bigger role, too.

There also is the possibility that other disruptors, such as autonomous vehicles (AV), could have a similar and even greater impact over time. At this stage, we believe any large-scale commercial deployment of AVs is significantly more uncertain than EVs and likely several decades away (2030-2040), given the additional hurdles beyond technology, such as consumer behavior and acceptance, as well as safety issues. Furthermore, rapid deployment of technology is contingent upon significant scaling up of engineering spending, data processing capabilities, and the collection of significant autonomous test miles to ultimately receive regulatory approvals. In the event that AVs without human drivers make market inroads sooner than expected (and follow the growth of battery electric or hybrid vehicles), it could lead to a sustainable competitive advantage. The rapid deployment of self-driving fleets could help first movers establish significant barriers to entry, particularly in major metropolitan areas, where penetration of autonomous ridesharing over vehicle ownership is likely to be higher. However, a risk factor is that autonomous driving in cities will reduce the importance of branding and may lead to a more commoditized experience for passengers who are no longer drivers.

Oil and gas

Over the next decade, we see downside to oil demand as a limited risk because each 1 million EVs (roughly equal to 2017 EV sales) only replace about 20,000 barrels/d and oil demand growth should continue on the back of growth from commercial transport and chemicals, with demand growth over the next three to five years projected to continue potentially above 1%. Longer term (beyond 2030), although both the rate of change and scenarios are less certain, the shift of light vehicle transport to EVs is more critical and could contribute to declining demand for oil products. The long lead time until EVs take over should allow the major oil companies to look for alternative growth routes, with more focus on gas and renewables. These two energy sources are well placed to meet some of the increased demand for electricity from power producers as a result of EVs. Gas makes up about half of the reserves and production of the five super major oil companies.

For oil producers, growth in demand from emerging markets for transport remains the larger factor in the near term, whereas 47% of crude oil is currently used in road transportation. About 1.2 million EVs (including lighter trucks, source: EV-volumes.com) were sold in 2017 compared with total global car sales of between 93 million and 95 million. Platt's Analytics has pointed to an oil demand loss of 20,000 barrels per day (bbls/d) for each additional million EVs. Even if assuming EV sales multiplied to 10 million-15 million in 2025, it would imply an initial impact of a 200,000-300,000/d decline in oil demand, compared with current production of about 95 million bbls/d. Over the longer term (after 2030), as EV market share translates into higher EV stock levels, the cumulative impact of the shift to EVs and heavier trucks could result in downside to global oil demand, outweighing the continued growth projected from commercial transport and chemicals.

We see oil-focused producers with reserves at the high end of the cost curve as most exposed. While producers have focused on shorter cycle developments, including shale, in recent years of low prices, the investment profile is also important. A high cost development could still

be economically attractive, if the costs are front loaded and the long-term investment needs to maintain production are low. As with existing, producing developments, even if oil prices are low, the capital cost is largely sunk. As demand and potential returns wane and companies pull back on investment, free cash flow generation could actually increase. Such a lack of reinvestment can't ultimately support a sustainable business model, however.

Oil refineries also face a potentially painful transition over time as demand for their oil products softens and declines and also as the mix of products changes over time. Many refineries can only make relatively modest changes to their product slate. Changing their configurations, to produce, at first, less gasoline, then also likely less diesel, even where possible could involve material investment, which might not be economic. We note that, over time, the age of many Organization for Economic Cooperation and Development refineries could result in capacity closures that offset some demand weakness. For refiners, as well as producers, the rate at which these different dynamics evolve will be critical.

U.S. regulated utilities

For U.S. utilities, the "electrification of transportation" presents growth opportunities when pursued in a credit-friendly manner with adequate regulatory support. With load from EVs contributing about 1%-4% to total projected load over the next 15 years, general energy efficiency savings are, however, likely to offset EV-related consumption. We expect EV revenue growth for regulated utilities to be two pronged, resulting from an increase in electricity demand as well as from higher capital investment in electric vehicle supply equipment (EVSE) or EV charging infrastructure.

We believe greater electricity demand from drivers will result in moderate growth, with any meaningful increase in consumption accruing over about five to seven years or longer. We project EV-induced load, in aggregate, to remain less than 5% of total projected load growth by 2035. This estimate includes projected demand from battery plug-in electric light-weight vehicles, but excludes recently announced electric heavy-duty trucks. Large-scale production of electric heavy-duty trucks has the potential to increase demand over and above our current projections.

EV charging infrastructure offers more immediate growth potential because it entails asset ownership, expansion of the rate base, and an opportunity to earn a regulated return on EV investment. We consider availability of EV-charging infrastructure as an important catalyst for widespread adoption of EVs. The U.S. currently has only about 43,000 charging outlets and would need many more to match the projected growth in EVs (or China's 150,000 outlets). A study by the Edison Electric Institute estimates that five million charging outlets will be needed by 2025 to support about seven million electric cars on the roads.

Over the next few years, we expect large-scale deployment to be limited to California, where the state's three-largest investor-owned utilities are ready to spend close to a combined $1 billion over five years on EV infrastructure programs, subject to regulatory approval.

Metals and mining

The auto industry is one of the main consumers of bulk commodities. About 25% of the total production of steel is transformed into car bodies. The long arching trend of improving the efficiency of cars led to a transition from commodity grade steel into a highly advanced composition, mixing

the iron ore with other metals (including chrome) and more recently using aluminum, plastic, and carbon fiber. Electric cars are not going to accelerate the shift to complex materials. Currently, the auto industry is responsible for 5%-35% of the main commodities.

The introduction of electric cars will result in higher demand for certain commodities, like cobalt, lithium, copper, and nickel. The impact of the swing will not spread evenly. We see three categories of demand:

- More abundant and cheaper commodities such as copper, aluminum, and nickel;
- Critical commodities for batteries such as lithium and cobalt; and
- Energy and grid commodities such as coal and nuclear.

One of the main concerns in the market is that a healthy demand for EVs will be slowed down by the short supply of lithium and especially cobalt (each car requires about 60-65 kilograms (kg) of lithium and 3.8-4.2 kg of cobalt). In 2016, the total amount of mined cobalt was about 100,000 tons. This could reach 200,000 tons or more by 2025, depending on different electric car penetration scenarios. Recently, Glencore PLC announced that it will double its cobalt production, aiming to produce 63,000 tons by 2020. This increase is equivalent to about 7.5 million new cars.

With lithium prices soaring by more than 300% over the past two years, there are more than 20 lithium projects in the market in different stages, mostly executed by junior mining companies. While there could be a timing mismatch between demand and supply, we cannot rule out a scenario that will translate into an oversupply of lithium in the next decade. It is, however, important to mention that even a very sizable hike in lithium prices will have only a modest impact on the price of a battery and on the overall demand for electric cars.

Looking further into the future, the change in the technology of batteries may lead to some changes in the battery composition and to slightly less demand for specific commodities, with cobalt being the main candidate to be replaced with nickel.

Finally, we believe that the trend toward EVs (and along the value chain—from small components such as wire and batteries, to charging stations, to smart grids and infrastructure) could result in copper demand increasing by 10%-20%. Already today, without a significant impact from EVs, we foresee a shortfall in the copper supply-demand balance taking place in 2019 without any large-scale projects coming online.

As to the impact on credit quality, most of the major mining companies have a sizable exposure to copper. On the flip side, the exposure of the major miners to less common commodities is rather small (for example, the contribution of lithium to Rio Tinto PLC's EBITDA is less than 1%). On the other hand, companies such Eurasia Resource Group (ERG) S.a.r.l. will be the immediate winners. The company is about to launch a tailing reclamation project in the Democratic Republic of the Congo, and with current prices, it is estimated to have economically abnormal returns. Other junior miners with sizable projects include Montero Mining in Namibia, Kodal Minerals in Mali, and Premier African Minerals in Zimbabwe.

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