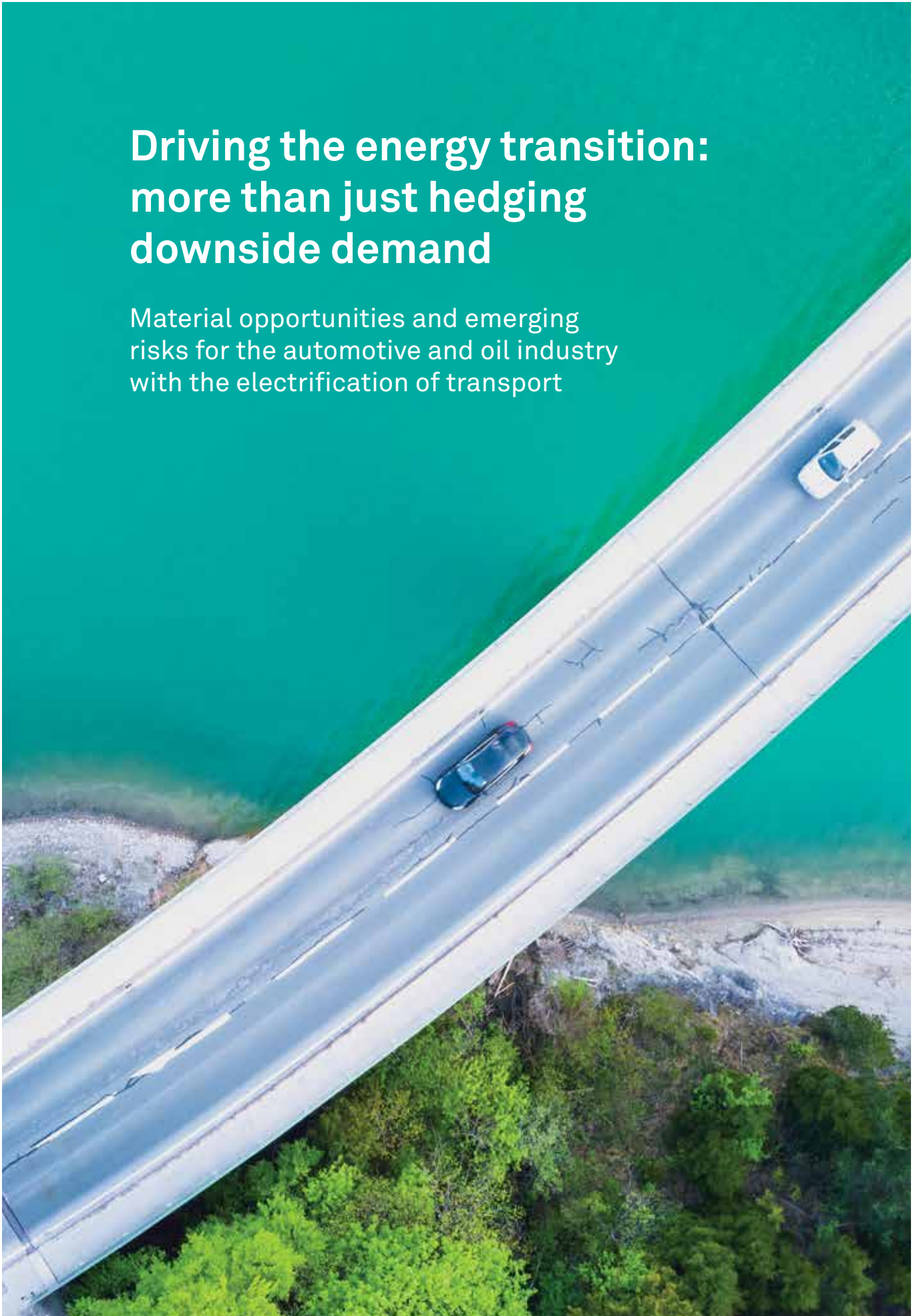


Driving the energy transition: more than just hedging downside demand

Material opportunities and emerging risks for the automotive and oil industry with the electrification of transport

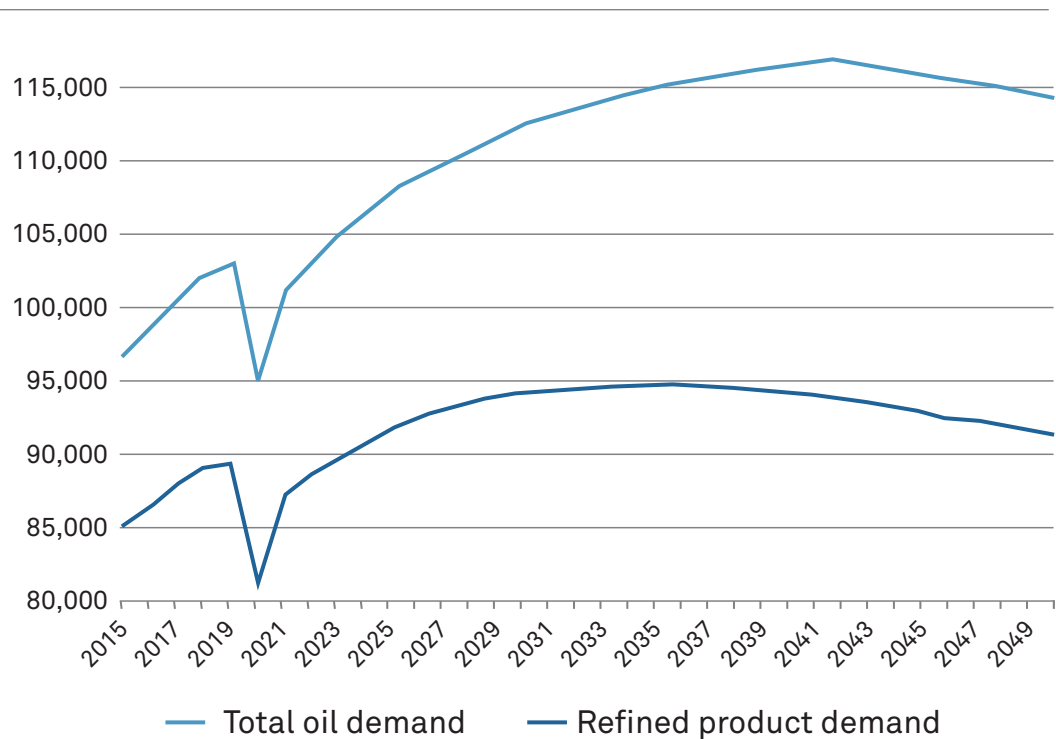


Electric vehicles role in the energy transition

The price of oil saw dramatic variability in 2020, driven by radical shifts in consumer behavior and significantly lower energy demand amidst the uncertainty of the COVID-19 pandemic. Though oil demand is anticipated to weather the storm in the short run, bigger waves are coming. As the energy transition proceeds, particularly the broader transformation of the transport sector to electric vehicles (EV) and more

regulated fuel-efficient internal combustion engines (ICE), global demand for refined oil products is forecasted to peak in mid-2030. At this point, aggregate demand for refined oil will reach its maximum and then start to decline (See Figure 1). Refined products for vehicle transportation only represent a portion of absolute oil demand. They are only one of the contributing components of the energy transition and the impending decline in oil demand. Nevertheless, this potential reduction of demand represents a significant material opportunity and emerging risk for both the oil and automotive industries.

Figure 1: Oil and Refined Product Demand Forecast



Note: CO2 figures reflect energy combustion emissions only. MMBOED – million barrels of oil equivalent per day. Source: Platts Analytics Future Energy Outlooks¹.

¹ Mozur, M., Watters, T., Redmond, S., Nietvelt, K., & Schiavo, M., (2020). The Energy Transition: COVID-19 And Peak Oil Demand. S&P Global Platts and S&P Global Ratings, divisions of S&P Global Inc



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The energy transition encompasses many different angles. These include, but are not limited to, oil and gas diversification, automotive and transport transformation, alternative drive train adoption at the commercial versus consumer level, and renewable energy opportunities. In this article, we will narrow our focus and assess how the electrification of transport within the broader energy transition, and more specifically the adoption of EVs for both consumer and commercial operations represents material risks and opportunities as reported by companies in the S&P Global Corporate Sustainability Assessment (CSA) and scenario forecasts for automotive and energy companies.

We will begin by introducing the electrification of transport and how automotive companies are addressing the associated risks and opportunities. Next, we will discuss how this fits into the energy transition more holistically and how traditional oil companies are preparing (or not) for the anticipated peak in motor oil demand as reported in the CSA. Lastly, we will conclude by summarizing the main points and introducing two new themes intended to be launched in the CSA surrounding EV range and efficiency.

The electrification of the transport sector

The automotive industry is undergoing a transition towards electrification. This is driven in part by environmental concerns, inhibitive regulation on CO₂, particulate and nitrogen oxide (NO_x) emissions, and consumer interest. Extrinsic motivation for EV adoption and portfolio re-allocation of automotive manufacturers towards EVs resonates in part from the stringent public policy on emissions (see Figure 2 below for major markets emissions targets). Taking the EU as a specific example, transportation as a whole (commercial and consumer transport) is responsible for approximately 30% of the EU's total CO₂ emissions. Out of this, 72% come specifically from road transportation, including heavy-duty trucks, light-duty trucks, motorcycles, and cars². Delving into greater granularity, cars alone represent 60.7% of the EU's transportation emissions³. To curb these emissions, European policymakers have committed to an aggressive stance on emissions reduction, with an ambition to reduce emissions from transport as a whole by 60% from its 1990 levels by 2050. Globally, in China the government is targeting 20% EV penetration by 2025, California has committed to requiring all vehicles sold by 2035 to be zero-emission⁴ and 17 other countries have announced plans to transition to zero-emission vehicles or phase-out ICE vehicles by 2050⁵. Many major cities, including Paris, London, Los Angeles and Tokyo, have pledged fossil-fuel-free streets by 2030 and only zero-emission buses from 2025⁶.

² <https://www.europarl.europa.eu/news/en/headlines/society/20190313ST031218/co2-emissions-from-cars-facts-and-figures-infographics>

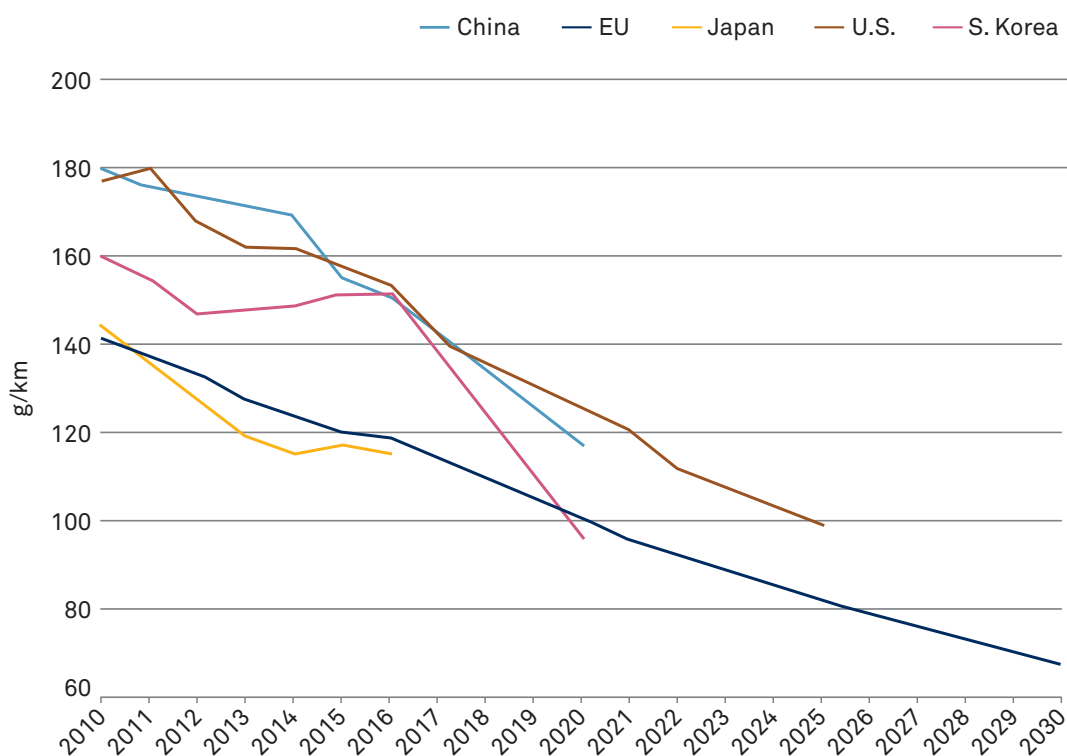
³ Ibid

⁴ <https://www.gov.ca.gov/2020/09/23/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-dramatically-reduce-demand-for-fossil-fuel-in-californias-fight-against-climate-change/>

⁵ <https://www.weforum.org/agenda/2020/09/heres-how-electric-vehicles-can-keep-us-on-the-road-to-paris/>

⁶ <https://www.c40.org/other/green-and-healthy-streets>

Figure 2: Historical, enacted, and proposed CO2 emissions targets for passenger cars.



Source: S&P Global Ratings a division of S&P Global Inc.⁷

According to the CSA, leading automotive companies have reported that EVs represented on average 1% (or less) of new cars sold in 2019 (excluding Tesla Motors). In the light-duty vehicle segment for the same year, they only amounted to less than 1% of the global car fleet⁸. EVs have become relatively less competitive due to unusually low oil prices.

On the upside, however, EVs – after hitting a minor road bump – are on track to achieve a record 3.3% market share in 2020⁹. Within the light-duty vehicle category, major automotive companies have taken firm stances on developing and innovating for EVs. For example, Volvo pledged that all of their new vehicles as from 2019 will be launched with an electric motor, diversifying their portfolio to fully electric, plug-in hybrid and mild hybrid vehicles. Further automotive manufacturers, including the Volkswagen Group, BMW, Honda and Toyota, have made commitments to diversify their

vehicle-portfolio extensively and increase their percentage of electric new cars sold, in some cases upwards of 50% of total new sales over the medium- and long-term.

Outside of the automotive industry, we observe many other businesses committing to facilitating this transition and reducing their own emissions by joining the EV100 Campaign¹⁰. These efforts often revolve around curbing their own emissions through electrification of their vehicle fleets for commercial transportation, including both passenger light-duty vehicles (PLDV) and medium and heavy-duty vehicles (MHDV), such as buses or heavy-duty trucks, and by investing in charging infrastructure for their customers, subsequently helping to facilitate further EV adoption.

While it is certain that ICEs and EVs will share the road, original equipment manufacturers (OEM) and tier-1 suppliers are faced with a significant material opportunity to

⁷ Orłowski, L., Stegert, A., Pery, M., Seiltgens, E., Amano, M., Hu, L., Chan, S., Ferraris, V., & Madlani, N., (2019). The Future is Electric: Auto Suppliers And The Emergence Of EVs

⁸ <https://www.iea.org/reports/global-ev-outlook-2020>

⁹ Klein, D., Mozur, M., McDonald, Z., & Kramarchuk R., (2020). Future Energy Outlooks Quarterly Update, November 2020. S&P Global Platts a division of S&P Global Inc.

¹⁰ <https://www.theclimategroup.org/about-ev100>

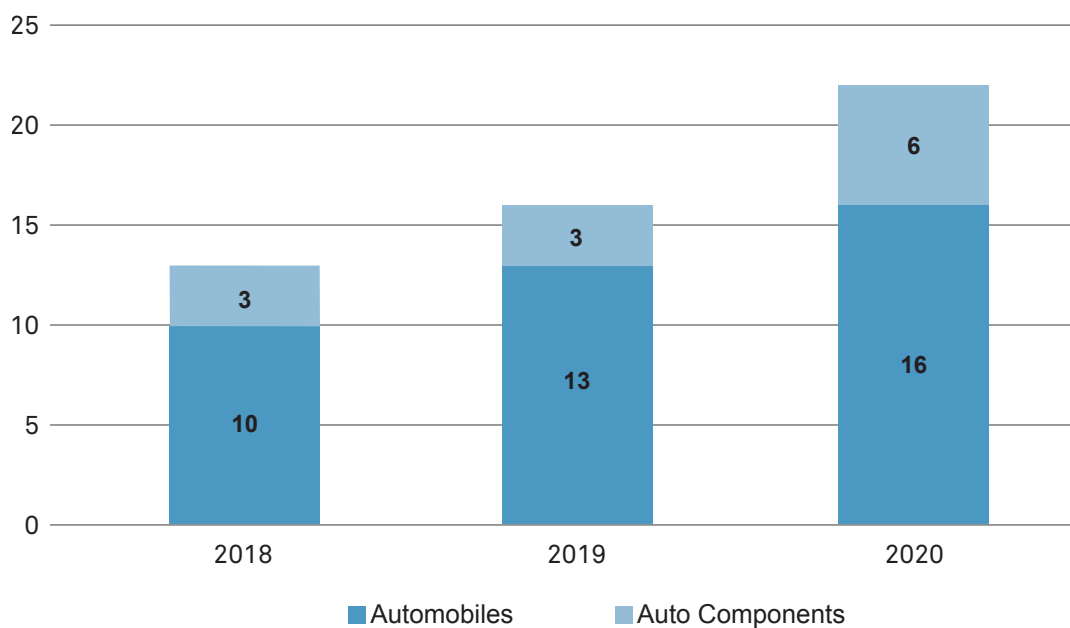
diversify their portfolios towards more fuel-efficient vehicles. In this way, they would be simultaneously addressing the demand from increasingly environmentally conscious consumers and adhering to regulations on stricter emissions standards. Particularly, manufacturers are likely to focus their near-term electrification strategy on the EU in order to adhere to the strict EU fleet-wide average emission target for new cars of 95g CO₂/km, 2021, phased in from 2020. This is a lower, more aggressive target, compared to the 2015-2019 one of 130g CO₂/km, considering that the average emission of new cars registered in 2019 in the EU28, Iceland, and Norway was 122.4g CO₂/km¹¹. Combined with expanded EV purchase subsidy programs since 2020 in France, Germany, Poland, Spain, Austria, Greece, Italy, Croatia, the UK, and the European Commission, the EU-27 and the UK will continue to lead the world in EV adoption¹².

BloombergNEF's Electric Vehicle Outlook 2020¹³ suggests that, by 2022, consumers will be able to choose amongst over 500 different

EV models globally and that, by 2040, 58% of all passenger vehicles sold will be electric. This would be a significant increase from the anticipated 28% forecasted to be sold in 2030. Overall, this would represent 31% of the global passenger vehicle fleet on the road in 2040 and 8% in 2030¹⁴. Platts Analytics Long-Term EV Outlook further suggests pure electric vehicles will become cost-competitive with traditional ICE by the mid-2020s¹⁵. Furthermore, consumers will be more inclined to adopt EVs as battery prices continue to fall and extended possible driving ranges ease the anxiety of potential EV customers. Such comparable costs and performance levels, combined with a plethora of choices will be key drivers in attracting buyers.

Not surprisingly, there has been an increasing number and percentage of CSA respondents in the automotive sectors (automobile and auto component companies) reporting that EVs or alternative drive trains rank as one of their top three material topics and business strategies that drive their long-term value creation –

Figure 3: Number of automotive companies and component manufacturers reporting on EVs and Alternative Drive Trains as a material issue.



¹¹ https://ec.europa.eu/clima/policies/transport/vehicles/cars_en

¹² Klein, D., Mozur, M., McDonald, Z., & Kramarchuk, R., (2020). Future Energy Outlooks Quarterly Update, November 2020. S&P Global Platts a division of S&P Global Inc.

¹³ <https://about.bnef.com/electric-vehicle-outlook/>

¹⁴ Ibid.

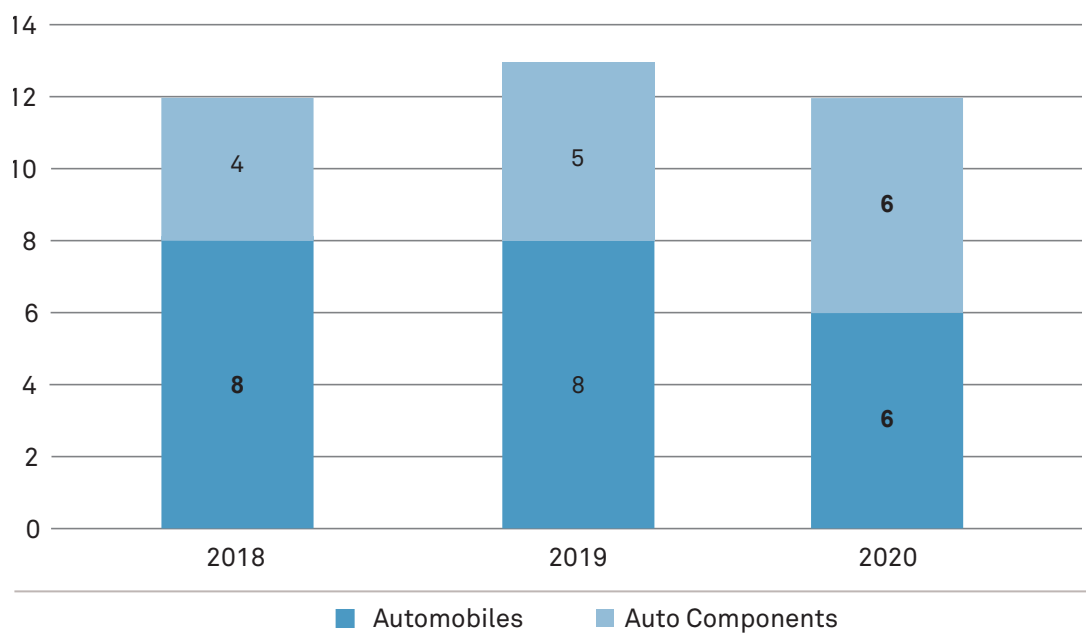
¹⁵ McDonald, Z., Mozur, M., & Kramarchuk, R., (2019). Long-Term Electric Vehicle Outlook. Drivers & Implications of Transport Electrification. S&P Global Platts a division of S&P Global Inc.

Source: S&P Global, data compiled from companies' annual and sustainability reports.

also for shareholders – and competitive position (Figure 3). This represents 58% of CSA respondents within these sectors and almost one-third of automotive companies eligible for the Dow Jones Sustainability Indices (DJSI) in terms of free-float market capitalization. Looking more closely, when only comparing amongst their unique industry, auto components companies (32%) are following automobile companies (84%) in reporting this as a top material issue; an increasing trend in both industries as the electrification of transport becomes ever more prevalent. This does not come as a surprise with the clear complementary nature of these industries and we anticipate further prevalence of such reporting for both automobile and auto components companies in the immediate future. Companies that are positioning themselves to meet or exceed future regulatory standards will improve their competitive advantage, not only by reducing the risk of costly penalties, but preparing themselves to capture the ever-increasing market for EVs and transitioning away from products that are at risk of reduced demand.

We see a decline in the number of automobile companies reporting the electrification of transport as a long-term emerging risk (Figure 4). Automobile companies have rather reported their recognition of the immediate significant impact that electrification has on their operations (Figure 3). On the other hand, a growing number of auto components companies are reporting that electrification is a long-term emerging risk to their operations within the next 3-5 years (Figure 4), but not amongst the most material issues today. Compatibly, this represents 32% of auto component companies and 32% of automobile companies that actively responded to the CSA in 2020. However, as suppliers' competitive positions will likely depend on their ability to provide environmentally and socially sustainable innovative products and technology (whether radical or incremental to their existing offering), we anticipate greater numbers of auto component companies reporting on this risk/opportunity hand-in-hand with the automobile companies. Further common emerging risks reported within the automotive

Figure 4: Number of automotive companies and component manufacturers reporting on EVs and Alternative Drive Trains as a long-term emerging risk.



Source: S&P Global, data compiled from companies' annual and sustainability reports.

industry revolve around the sharing economy and mobility services: While some companies report mitigating actions, including developing and co-developing applications and marketplaces, we anticipate that the ownership model of vehicles in the future will also be reported on more frequently, both as a material issue and an emerging risk.

Companies must carefully plan their long-term decarbonization strategies with a holistic focus on product lifecycles, the embedded carbon of their materials, and end-of-life recycling.

In the meantime, manufacturers are already innovating to design their ICE vehicles with lighter-weight materials to improve fuel efficiency by reducing overall vehicle weight. This is primarily to adhere to increasingly stricter fuel-efficiency and emissions standards, but it also provides complementary spillovers that will benefit their EV offerings for range and efficiency. While this is a step in the right direction towards achieving emissions reductions, it is also important to highlight the other side of the coin: the companies that are *not* reporting on EVs and alternative drive trains as neither emerging risks nor current material issues. Today, EVs barely make up a fraction of major automakers new car sales. Although EVs constitute a massive business opportunity for many companies providing vehicles in the low-carbon economy, many CSA respondents are yet to prioritize this.

While it appears clear that consumer preferences and political regulations are favoring the adoption of alternative drive trains, there exist fundamental challenges holding back the accelerated adoption of EVs. On the consumer side, common factors – including price, value, quality and scarce charging infrastructure – make EV adoption less favorable to range-anxious consumers, typically outside the smaller pool of eager early adopters. On the supplier side, OEMs

and equipment suppliers may be faced with unsustainable supply chains as increased demand for EVs implies increased demand for battery metals and advanced electronic components, particularly conflict minerals and cobalt. Sustainable procurement policies and supply chain due diligence will become increasingly important for manufacturers, as they face significantly stricter compliance obligations for their minerals supply chain. More holistically, OEMs must also consider the entire lifecycle assessment (LCA) of the impact that these new products will have. This goes beyond the upstream procurement policy and encourages OEMs to examine both the type and the source of the inputs and the outputs of the materials together with the energy required in the production of the vehicles. Best practice also involves addressing environmental and social impacts directly attributable to the functioning of the EV throughout its life cycle. Companies must carefully plan their long-term decarbonization strategies with a holistic focus on product lifecycles, the embedded carbon of their materials, and end-of-life recycling. This is particularly pertinent for EVs and the reliance on battery metals and materials that tend to be sourced from otherwise emissions-intensive industries (i.e. mining). As demand for electric vehicles grows, so too will the awareness around these risks.

The electrification of transport not only represents a disruption to traditional oil players addressing motor-oil demand, but also a significant material opportunity. In this section, we will discuss the evolving impact of the electrification of the transport sector for oil companies and how companies are responding to this emerging risk/opportunity.

One of the most significant material ESG risks to oil companies stems from the pace at which the energy transition away from oil and carbon-based fuels is realized. Holistically, this includes government regulation promoting renewable energy and curbing pollution (including both hazardous waste and air pollution), reduced demand for plastics (largely derived from petrochemicals),

and the rate of the electrification of transport, amongst other factors.

While Platts Analytics' forecasts of EV adoption growth have been tempered by weaker oil price expectations in response to COVID-19, the steady shift in new-vehicle sales away from internal combustion vehicles to EVs will displace gasoline/diesel demand by approximately 8 million b/d by 2040. Platts Analytics Future Energy Outlooks estimate that, were it not for this demand displacement, global oil demand – even for refined products – would continue to increase well into the 2040s and likely the 2050s.

Companies are doing more than just hedging this impending downside demand, but instead investing in material opportunities that will seek to fill the vacuum that decreased demand for motor oil will create.

While the scenarios referenced here, corresponding with the anticipated tipping point for EV adoption and EV market saturation, are 10-15 years away, we are seeing oil and gas companies pre-empting their downside demand with accelerated investments into the electrification of transportation and its related infrastructure. In the past three years, we have seen a growing number of oil and gas companies reporting that the electrification of transport is already a pertinent material issue affecting their operations (Figure 5), while others are recognizing it as an emerging risk, anticipated to affect them in the medium and long term (3-5+ years) (Figure 6). This goes beyond decarbonizing their existing portfolio mix of production and reserves of total hydrocarbons and includes investing in substitutable – and sometimes complementary – opportunities in renewable energy, alternative biofuels, and facilitating expansive charging networks. Companies are doing more than just hedging

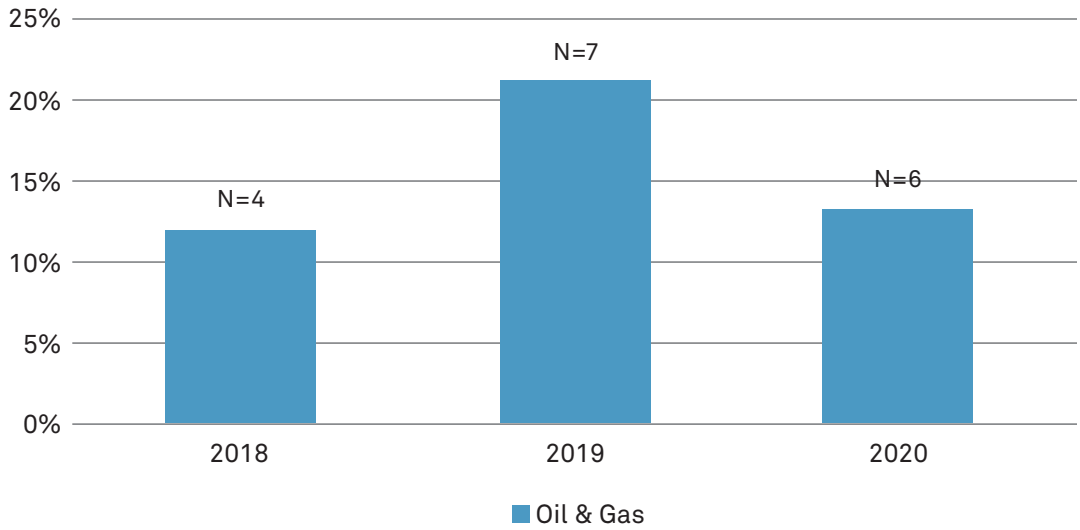
this impending downside demand, but instead investing in material opportunities that will seek to fill the vacuum that decreased demand for motor oil will create.

While there is a decrease in the percentage of overall CSA respondents declaring electrification of transport as an emerging risk from 2018 to 2020, there is an absolute increase in the number of companies reporting on this risk. However, expectedly and maybe more pertinently, in 2020 companies' reporting centered on the current historic state of the market and its anticipated ripple effects in the near and medium future. Notably, in 2020 the oil sector experienced extreme price volatility evidenced by historic lows resulting from a COVID-19 led demand destruction and the lack of cohesion in an oil deal that would have curbed oil production in an effort to stabilize the market. While the electrification of transportation will nevertheless have an impact on producers' and refiners' demand, more immediately, companies are responding to today's market situation.

Additional notable material ESG criteria at the fore of many companies' agendas and reporting include occupational health and safety, disaster avoidance, and risk mitigation. These range from low-probability events with devastating consequences to more frequent low-impact events, and energy portfolio allocation. All of which could represent significant material costs to the company if not ensured.

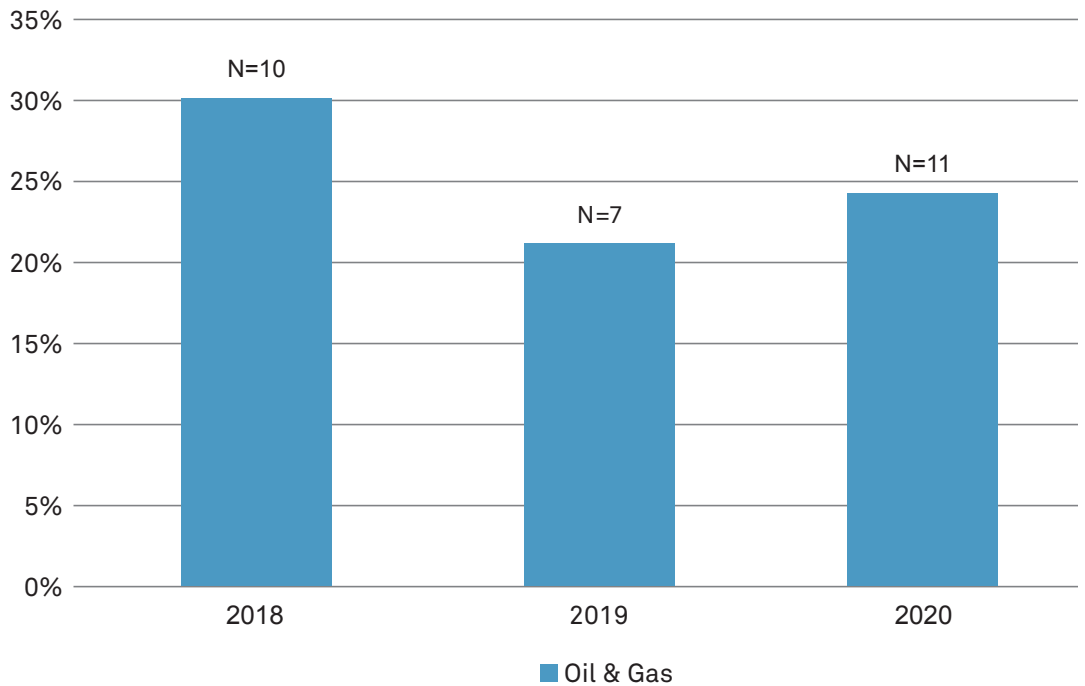
- Safety management remains one of the pre-eminent material issues for oil companies given the particularly risky nature of the operations and the likely harsh conditions or locations in which they operate.
- Prevention of accidents not only ensures the safety of their employees, but also protects the environment, safeguards continued operation and production, and contributes to their social license to operate.

Figure 5: Percentage of Oil & Gas companies reporting on EVs and Alternative Drive Trains as a material issue. (N = number of companies that have responded that EVs and alternative drive trains are a material issue)



Source: S&P Global, data compiled from companies' annual and sustainability reports.

Figure 6: Percentage of Oil & Gas companies reporting on EVs and Alternative Drive Trains as a long-term emerging risk. (N = number of companies that have responded that EVs and alternative drive trains are a material issue)



Source: S&P Global, data compiled from companies' annual and sustainability reports.



Oil majors are recognizing a material opportunity to protect and grow their shareholder value early in the wave of the electrification of transport, and they are well-positioned for it.

- While oil and gas production/refining and reserves are still the key drivers for value creation and future earnings in the sector, companies are faced with increasing pressures from investors, policymakers, and consumers to decarbonize their business model in the long run.

Over the next two decades decreased refined product demand due to vehicle electrification will not be the final blow for oil companies, particularly as overall oil demand is expected to continue to increase, until plateauing in the latter half of the 2030's. This stems in part from growing demand from emerging markets for transportation, and strength in petrochemicals (Figure 1). As such, the long lead time ahead of this tipping point should allow for major oil companies to decarbonize their portfolio stepwise and pursue alternative growth routes within

this anticipated new market. This will help overcome the downside demand in their traditional portfolio in favor of natural gas and renewables. More immediately, the existing environment – characterized by a near-term decreased demand, an oversupply of production combined with lower-than-usual prices, and anticipated opportunities in renewables – presents fruitful areas for strategy and restructuring. We anticipate this to more directly impact upstream oil and gas companies conducting exploration and production, yet the symbiotic relationship of the midstream sector to its upstream collaborators suggests that they too may face significant consequences.

Select oil majors have begun to increase their investment and ownership, thus facilitating the electrification of transport. Aggressive investment strategies into EVs, and more generally power, appear to be more than hedging their downside demand from the vacuum left over from decreased demand for traditional oil products. Oil majors are recognizing a material opportunity to protect and grow their shareholder value early in the wave of the electrification of transport, and they are well-positioned for it. Their experience in retail fuel and

power supply position them as natural and competitive contenders. Combined with the compatibility of their traditional business model with new models including power supply and generation through renewable power generation and investments, and their experience with costly and long-term specialized brick and mortar projects and R&D that have long payback periods, positions them as natural and competitive contenders.¹⁶

Total, BO and Shell have engaged in M&A and investments into E-mobility, battery storage, renewable energies, and energy supply, strengthening their position in renewable energy, while blurring the lines of the traditional oil and gas business model to more holistic energy companies. This is particularly pertinent for improving the environmental friendliness of EVs, as the share of energy supplying EVs from renewable sources is set to increase. Total has reinforced their position as a player in electric mobility with their acquisition of 'Blue Point London', which has added more than 1,600 on-street charge points, contributing to their ambition of operating more than 150,000 EV charge points by 2025. This, in addition to their investments

in Saft Groupe¹⁷, EREN Renewable Energy¹⁸, G2Mobility¹⁹, and Direct Energie²⁰, gives a strong market signal of their commitment to the energy transition and positions them as competitive players. BP's investments into Lightsource²¹, Chargemaster²², and StoreDot²³ – and their target of 70,000 EV charge points, a near 10-fold increase from current numbers – make significant inroads in the electrification of transport. Combined with their market signal to significantly reduce hydrocarbon production while increasing renewable power generation 20-fold from 2.5 GW in 2019, these steps highlight their commitment to the energy transition and to becoming a holistic energy company²⁴. Shell established its New Energies division in 2016 focusing on new fuels for transport (biofuels and hydrogen, amongst others) and the entire business process around power, including electricity generation, buying and selling, and direct to consumer supply. Shell's investment and acquisition strategy underlines their dedication to the energy transition, and the electrification of transport more specifically, with particular investments into New Motion²⁵, First Utility²⁶, Greenlots²⁷, Sonnen²⁸, and Green Star Energy & Hudson Energy²⁹.

¹⁶ Georges, P., Ferraris, V., & Vinot, E., (2019). European Utilities May Not Be Best Placed To Grab The Infrastructure Market For Electric Vehicles. S&P Global Ratings, a division of S&P Global Inc.

¹⁷ <https://www.total.com/media/news/press-releases/total-takes-control-saft-groupe-after-successful-tender-offer-which-will-be-re-opened-july-19-august>

¹⁸ <https://www.total.com/media/news/press-releases/total-partners-eren-renewable-energy-expand-its-renewable-business>

¹⁹ <https://www.total.com/media/news/press-releases/electric-vehicle-charging-solutions-total-acquires-g2mobility-and-forms-partnership-nexans>

²⁰ <https://www.total.com/media/news/press-releases/total-completes-acquisition-73-direct-energie-and-files-mandatory-tender-offer>

²¹ <https://www.bp.com/en/global/corporate/news-and-insights/press-releases/lightsource-bp-to-accelerate-global-solar-growth-with-further-investment-from-bp.html>

²² <https://www.bp.com/en/global/corporate/news-and-insights/press-releases/bp-to-acquire-uks-largest-electric-vehicle-charging-company.html>

²³ <https://www.bp.com/en/global/corporate/news-and-insights/reimagining-energy/bp-invests-in-ultra-fast-charging-battery-company-storedot.html>

²⁴ <https://www.bp.com/en/global/corporate/news-and-insights/press-releases/from-international-oil-company-to-integrated-energy-company-bp-sets-out-strategy-for-decade-of-delivery-towards-net-zero-ambition.html>

²⁵ <https://www.shell.co.uk/media/2017-media-releases/electric-vehicle-charging-offer.html>

²⁶ <https://www.shell.co.uk/media/2018-media-releases/shell-completes-acquisition-of-first-utility.html>

²⁷ <https://greenlots.com/greenlots-announces-acquisition-by-shell-one-of-the-worlds-leading-energy-providers/#:~:text=LOS%20ANGELES%2C%20Jan.,of%20Royal%20Dutch%20Shell%20plc.>

²⁸ <https://www.shell.com/media/news-and-media-releases/2019/smart-energy-storage-systems.html>

²⁹ <https://www.shellenergy.co.uk/blog/post/shell-energy-retail-to-acquire-green-star-energy-and-hudson-energy>

This strategy places them in a competitive position to offer a range of complementary services for the energy transition, including EV residential charging options and renewable energy to business and consumers.

Conclusion

Amidst the ongoing energy transition, the automotive industry is moving towards electrification and oil companies are blurring their traditional business models in favor of more holistic energy strategies. This transformation is challenging companies in both sectors to think about emerging topics around EVs and how these will materialize in the form of new risks and opportunities.

The electrification of the transport sector is well underway, and oil producers and automakers are preparing for tipping points in one to two decades.

While such electrification represents an emerging and material risk to oil companies' traditional revenue streams, we are seeing oil majors facilitating the transition and supporting the adoption of EVs and alternative drive trains instead. They are doing so by removing the barriers for consumer adoption and creating long-term shareholder value – filling the vacuum left over from decreased demand of fossil-fuel-based options – while simultaneously decarbonizing their portfolios, and thus appealing to environmentally-conscious investors.

Automotive companies will need to do more than just change their portfolio of cars, but also provide the additional services and products to foster the transition to EV. This may include power supply services such as residential charging stations,

renewable battery sources, or software, amongst others. Such services will likely be developed in collaboration with other energy companies, like the acquisition strategies mentioned above, and with less traditional partners such as software companies, mobility services, and electric utilities.

The energy transition also envelops additional industries, equally driven by the criteria above. The electrification of transport does not only apply to complementary products around the automotive and oil industries: taking a macro viewpoint, we anticipate a diversity of companies that will see opportunities to capture value from this trend. Charging stations do not require the same design as traditional fuel stations, but can instead be incorporated into individual parking locations, malls, and airports. Such ease of access to charging infrastructure and early adoption by businesses not only facilitates refueling at every-day locations but differentiates their offerings against competitors. Heathrow Airport, for example, has committed to install charging at the airport for customers and staff by 2030. Consumers evaluating substitutable products/services may provide a relative competitive advantage to those that offer such services. Electric utilities also have a natural opportunity to fill the vacuum of reduced demand for fossil-fuel-based products within the energy transition and are currently investing similarly to their new energy counterparts: They are partnering directly with automakers and investing in charging infrastructure.



The electrification of the transport sector is well underway, and oil producers and automakers are preparing for tipping points in one to two decades. However, it must also be noted that this may not be enough. The World Benchmarking Alliance recently published the Automotive benchmark³⁰, which analyzes the performance of the top 30 most influential automotive manufacturers and has found that:

- less than 20% of companies have vehicle in-use emission reduction targets sufficiently ambitious to meet the below-2-degree pathway; and
- existing low-carbon vehicle sales are well below the amount required to reach said pathway.

To hold automobile manufacturers accountable and capture this emerging material trend, we intend to launch two new questions within the CSA for automotive companies. In the future, companies will be required to report more extensively on their low carbon strategy, as we expand our coverage of companies' preparation and exposure to the alternative energy transition, particularly electric vehicles for the automotive industry. As forecasts project

an ever-greater market share for electric vehicles and tighter regulation on tailpipe emissions, with significant material fines, these questions will address (1) battery range and (2) battery efficiency and life cycle. They will essentially capture who will be driving this transition, addressing the average 'fuel' economy and 'fuel' consumption for battery electric vehicles, while also implying reduced vehicle in-use emissions and reduced waste produced. Improved performance and extended driving ranges will ease the anxiety of potential EV customers leading to further adoption. While improved battery efficiency and life cycle will help to ensure more distance is able to be driven for each car before its end of life, hence spreading out the cars embedded emissions over a greater distance and reducing the frequency of waste being created. The questions in the CSA not only look at companies' strategies to reduce the carbon intensity of their car portfolio, but they also assess the exposure of their current portfolio to future regulatory risks and challenge companies on their product stewardship, namely their LCA and end of lifecycle responsibility. ■

Roman Kramarchuk, Head of Future Energy Analytics at S&P Global Platts contributed valuable insights to this report

³⁰ <https://www.worldbenchmarkingalliance.org/publication/automotive/>