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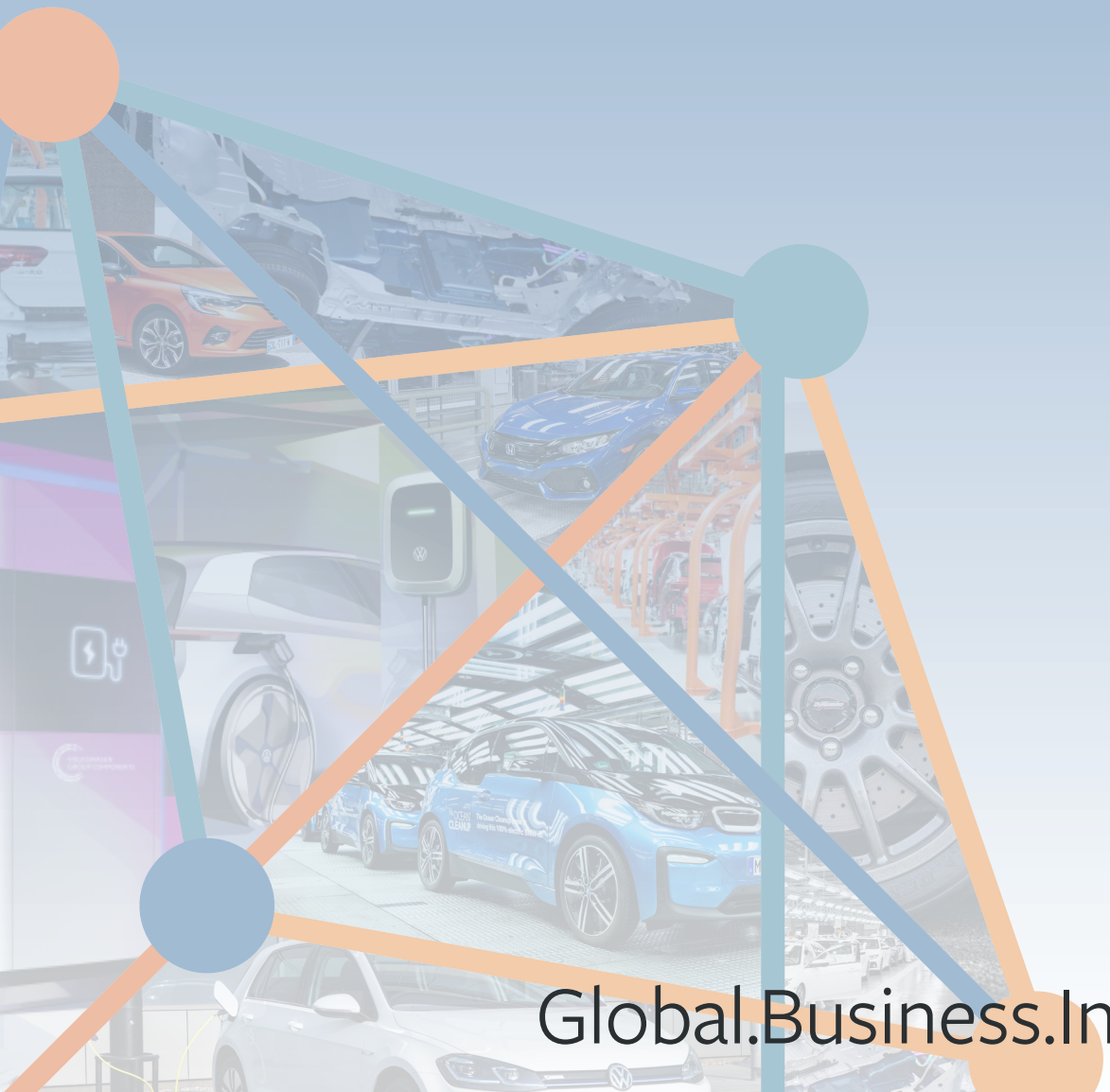
# Automotive headwinds **align into a perfect storm**



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**Ultima Media**

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## 1. Executive Summary

Global automotive manufacturers are currently facing sharply declining global vehicle sales and diminishing profits.

Ultima Media predicts a prolonged period from 2019-2023 of stagnating global sales and margin pressure during a critical period of industry transition.

A heady mix of factors including expensive investments in powertrain and digital technologies, tightening regulatory requirements for emissions, pressure from trade wars and slowing economic growth are combining to challenge the established business and operational models of most carmakers. The result is already reshaping the industry, including shifting sales from new to used vehicles, changing model mixes, shared investment and development costs, as well as job and production cuts in some areas. Further, more dramatic change is likely.

However, these changes also represent tremendous opportunity across the automotive value chain, as carmakers invest billions of dollars in connected, autonomous, shared and electrified (CASE) technologies. And in the coming years, the declining costs of production and ownership of technologies such as electrification should lead to a recovery in sales.

This report is the first in Ultima Media's forthcoming series of analysis and research, which will highlight the pressing industry issues and the resulting new business opportunities.

September 2019

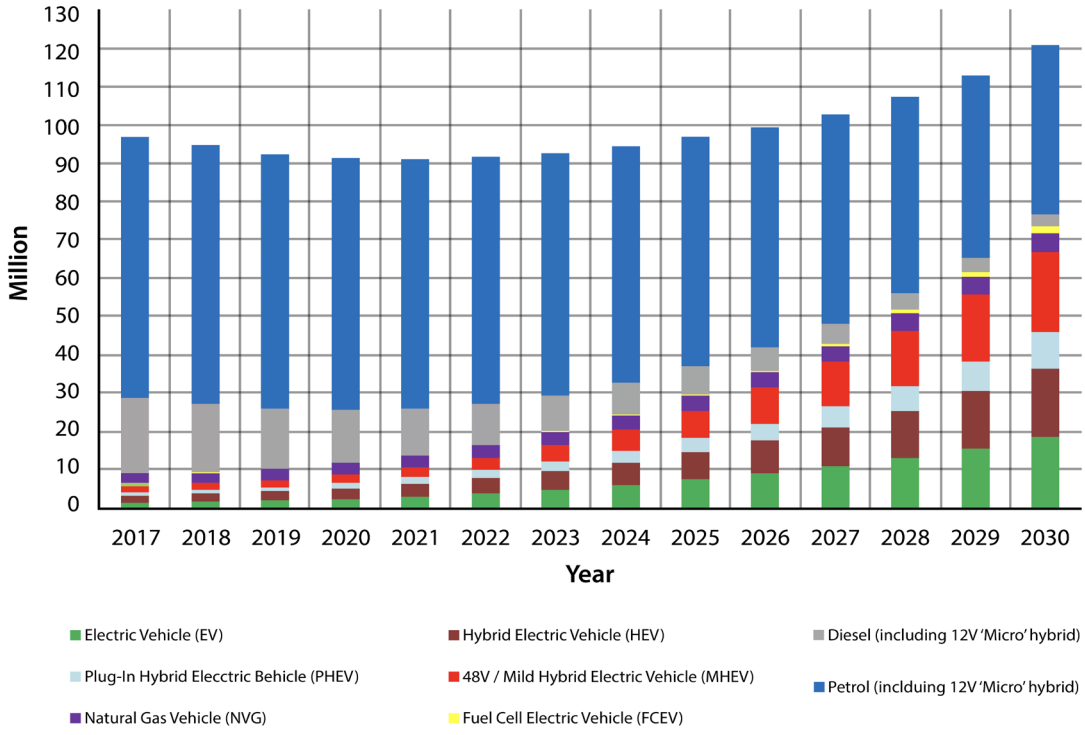
## 2. Global Sales Decline And Profits Impacted

### *Vehicle Sales Volumes Are Forecast To Grow By Only 1.2% CAGR From 2020-2025*

After a small drop in passenger and commercial vehicle sales in 2018, a sharp global contraction in vehicle sales has taken place of around 6% in H1 2019, marked by declines in nearly every major regional market. While we expect a slight recovery for H2 2019, we predict overall global sales will decline 2.7% from 95m units in 2018 to 92.5m in 2019. This sudden drop in vehicle sales has only been surpassed on one occasion in the post war period and that was in the aftermath of the global financial crash of 2008. The sales outlook for 2020 is for further decline before bottoming out at 91.3m units in 2021.

A modest recovery should then begin, however sales volume will only recover to previous 2017 volumes by around 2025. Sales volume growth from 2020-2025 is forecast to achieve only a 1.2% compound annual growth rate (CAGR). However, that anaemic growth outlook is followed by a recovery in the period 2025-2030 which is predicted to achieve 4.5% CAGR. Therefore, for the overall period 2020-2030, the CAGR is forecast to be 2.9%, which is closer to industry long-run averages. See Figure 1. (As a point of reference the average growth rate from 1950 to the present day was 3.4% CAGR.). Nonetheless, in that context, the period from 2020-2024 will remain a challenging transitional period of almost unprecedented low-volume growth for the automotive industry.

**Figure 1 Global Automotive Vehicle Sales Forecast By Powertrain 2017-2030 (Units)**




*Source: Ultima Media 2019*

## 2.1 Why Is This Happening Now?

- Declining economic growth impacting demand especially in China.
- Trade wars are hindering sales in China, Russia and Iran in particular, with uncertainty over Brexit also impacting sales in the UK.
- A tightening regulatory climate results in compliance costs which make vehicles more expensive deterring customers and making used vehicles seem more attractive.
- The shift toward leasing by OEMs is flooding the used car market with 'as new' vehicles, depressing used car prices as well as new car sales.
- The rapidly evolving powertrain mix is confusing consumers, so they are waiting for EV technology to mature before committing to a purchase.
- The gradual shift towards shared mobility, especially by younger, city-based millennials is leading to a decline in car ownership.

## 2.2 Profound Cost And Margin Implications For OEMs

- Electric vehicle powertrain and platform development costs are huge.
- Associated re-tooling and re-fitment of manufacturing plants for EVs are considerable.
- Potential fines are looming for OEMs that exceed EU CO2 emissions targets.
- All of which results in falling margins and reduced working capital to invest in advanced technologies.

This alignment of headwinds has been likened to a perfect storm that raises doubts over the viability of current and future business models. References to markets having reached 'peak car / peak auto' sales have also resurfaced. We don't believe peak car has yet been reached. However, unless OEMs quickly adapt to the new market realities, they could face a potential existential crisis.

Producing 95m polluting vehicles a year globally with the expectation of continuous growth (whilst regulators try their best to reduce vehicle emissions from profitable ICE vehicles) was always going to be an unsustainable trajectory. But many OEMs are now at risk of being seriously blown off course by this unfortunate convergence of macroeconomic, societal, technological and regulatory factors. Carmakers have issued profit warnings, while the share price of almost every OEM has fallen over the past year. Even for longer-term investors, the outlook for automotive manufacturers is still very much in doubt.

## 2.3 Why Is This Important?

Well, after a decade of continuous growth, the automotive industry – which generates revenues of around $3 trillion per year – will have to adjust to much tougher market conditions.

In terms of financial reporting and job cuts, the recent evidence is clear. And it's spread across most of the industry from volume OEMs to premium players, indicating that a fundamental structural change is underway. See Table 1 below.

These cuts are not just about the OEMs pruning back excess capacity. Ultima Media's reporting in automotive logistics, manufacturing, car design and IT indicates there are huge implications that will be felt all the way down the value chain. Tier suppliers have also announced job losses, for example, and have been consolidating at a fast pace.

**Table 1 Automotive OEM Job Losses & Financial Reporting H1 2019**

| | | |
|---|---|---|
| January 2019 | JLR | Announced it would axe 4,500 jobs worldwide. JLR's product mix means that it has a particularly high exposure to the collapse in diesel demand. |
| February 2019 | FCA | Cutting nearly 1,400 jobs at its Illinois plant. |
| March 2019 | FCA | Announces 1,500 job cuts at its Windsor, Ontario assembly plant. |
| May 2019 | Honda | Announced the closure of its factory in Swindon, UK in 2021 with the loss of 3,500 jobs. |
| May 2019 | BMW | Reported losses for the first time in 10 years due to the effects of higher investment spending and a €1.4bn ($1.55bn) legal provision relating to alleged emission cheating. |
| May 2019 | Ford | Announced it would cut 7,000 workers, or 10% of its force. |
| June 2019 | Ford | Announced it would close its Bridgend, UK engine plant in 2021 with the loss of 1,700 jobs. |
| July 2019 | Nissan | Announced plans to cut 12,500 jobs after a 98% fall in profits. This is around 10% of its workforce. |
| July 2019 | Daimler | Posted a Q2 2019 loss due to slowing Chinese demand, a diesel emissions scandal and product recall of Takata airbags. |
| July 2019 | Renault | For H1 reported net income down 49% to €1.05bn. |
| July 2019 | JLR | Reported pre-tax loss of £395m ($486m). |
| July 2019 | Aston Martin | Reported an H1 adjusted operating loss of £35.2m, compared with a £64.4m profit in 2018. |
| August 2019 | Mazda | Reported Q1 operating profit down 79% due to weak Chinese and US sales. |
| August 2019 | BMW | Q2 EBIT fell by 20% to $2.4bn due to foreign exchange and investments in EV and HEV to meet CO2 targets. Operating margins fell to 6.5% from 8.6% a year earlier, despite a 1.5% increase in sales |
| August 2019 | Honda | Q1 operating profit dropped 16% due to lower US car sales, however it retained its full fiscal year outlook of a 6% increase year on year. |
| August 2019 | Dongfeng PSA Peugeot Citroen Automobile | Reported a $363m loss in H1 due to deliveries falling 60% to 63,027 units. The joint venture agreed to cut thousands of jobs in China and drop two of their four shared assembly plants, according latest reports, in a drastic bid to mitigate heavy losses. |

*Source: Ultima Media 2019*

***In H1 2019, Automotive OEMs Announced Cuts Exceeding 32,000 Jobs Worldwide***

These job losses and plant closures are undeniably necessary amid sharply falling sales, but they are also indicative of structural overcapacity (especially within the EU) and inflexibility of production line volumes. Production line cost efficiency (and profit) falls with plants running at below 80% capacity. In many cases, fixed versus variable cost equations can make it more cost efficient to shut plants below 70% capacity and operate the remaining ones at nearer full capacity. In contrast, only a handful of the OEMs reported positive financial results and sales during H1 2019. And it's notable that PSA and VW achieved better financial results despite falling sales.

**Table 2. Automotive OEM Positive Financial Reporting H1 2019**

| | | |
|---|---|---|
| July 2019 | PSA | Recurring operating income rose 11 % to €3.34bn in H1 2019, lifting operating margin to a new high of 8.7% due to new models and the integration of Opel/ Vauxhall despite a 13% drop in global sales. |
| July 2019 | Hyundai Motor Co | Q2 2019 net profits climbed 31.2% to $780.44m from $594.7m in the same period last year. Revenue went up 9.1% to $22.9bn. |
| August 2019 | Volvo Cars | Announced July 2019 sales had increased by 7.1% year on year. |
| August 2019 | VW Group | Q2 2019 operating profit rose 30% to €5.13bn, up from €3.94bn in Q2 2018 despite a drop in vehicle sales of 1.8%, helped by VW brand's higher-margin SUVs and rising volumes at Porsche and Skoda. However, sales for July 2019 fell to 489,000 vehicles, a 3.3% reduction year on year. |

*Source: Ultima Media 2019*

## 3. Industry Risks

## 3.1 What's Underpinning All Of This?

Some might interpret the falling sales as a short-term blip, or as part of a cyclical trend. But the evidence indicates a multitude of interweaving factors. We believe there are signs that a profound structural change is being witnessed and OEMs will have to adjust to this new landscape.

Let's examine the factors in more detail.

## 3.2 Slowing Economic Growth Creates Economic Risk For Automotive OEMs

Slowing economic growth has led to many OEMs becoming exposed to an emerging risk – with even the premium brands such as Mercedes-Benz and BMW reporting losses.

Leading economies such as Germany, Japan, the UK and even the US are slowing and showing some of the early signs of an imminent recession.

However, a sharp drop in global vehicle sales is mainly due to (relatively) slowing GDP growth in China, the world's largest national car market. In H1 2019, new vehicle sales in China fell 12% year on year to 12.3m units. However, China has recently announced new policy guidance on encouraging automotive sales and this is expected to improve sales for H2 2019. Nonetheless, The China Association of Automobile Manufacturers (CAAM) has lowered its forecast for China's 2019 full year new vehicle sales from 28m units to 26.68m, a 4.7% decline from 2018's total. That would mark a second year of decline in vehicle sales after 2018 saw China's first drop in decades.

The US sanctions on China, Iran and Russia are impacting demand in these regions, too. The AEB Automobile Manufacturers Committee reported that Russian vehicle sales declined by 2.4% in H1 2019 to 830,000 vehicles. In Iran, sanctions have led to collapse in sales and investment, including the exit from the market of OEMs such as PSA and Renault.

US sales have also been falling due in part to increasing difficulties for consumers in obtaining credit for vehicle purchases. Eurozone sales are in decline with demand for new passenger cars down by 3.1% in H1 2019. In the UK, the Society of Motor Manufacturers and Traders (SMMT) reports that the country's vehicle sales are 3.5% down year on year through July, with car production down 18.9%.

In India, the situation is even more acute. According to the Society of Indian Automobile Manufacturers (SIAM), sales of passenger vehicles fell to 200,790 in July 2019, a 30.9% drop from the July 2018 sales. Sales have declined more than 20% for four consecutive months amid a wider slowdown in GDP growth.

With operating margins in the automotive industry typically in the range 4-8%, it has only taken a slight downturn in sales to hit profitability hard. This reduces liquidity and room for manoeuvre just at a time when there is intense pressure on OEMs to invest in transitioning to EVs, autonomous vehicles, connected cars, and advanced safety features.

## 3.3 Trade Wars Compound Economic Risks For The Automotive Industry

Ongoing sanctions by the US government are leading to a global trade war that has hit consumer confidence and contributed to falling demand, particularly in China. On 6th August 2019, the US government escalated matters by accusing China of being a "currency manipulator" by artificially reducing the value of the Chinese Yuan to make exports artificially cheaper and therefore more competitive. And the risk comes from the erratic, unpredictable trajectory of a trade war seemingly determined by the whim of President Trump's latest tweet.

And of course, the spectre of a "no-deal" Brexit scenario is horrifying for European OEMs and tier suppliers within the extended and very complex European supply chain. The spectre of tariffs (of around 10% on finished vehicles and 4% on components) with potential delays at customs borders is almost unthinkable for OEMs and tier suppliers who depend upon a finely tuned just-in-time/just-in-sequence supply chain. As a consequence, according to the SMMT, automotive Investment has collapsed in the UK to just £90m in the first six months of 2019, down from £347m in 2018. Before the referendum to leave the EU in 2016, the UK automotive industry averaged annual investment of £2.5bn to £2.7bn.

In response, UK companies have invested at least £330m in contingency planning, e.g. stockpiling of components, reserving warehousing capacity and new logistics systems – and at a time when working capital is dwindling due to falling sales and squeezed margins.

## 3.4 $CO_2$ Emissions Regulations Create Existential Risk For OEMs

There is a regulatory divergence in emissions regulations which is risky for the OEMs as the costs to develop the technology is mainly focused on the regional market which has the strictest emissions regime: the EU. While most other regions have less onerous rules, EU standards are influential, whether on rules set in California (which are stricter than US federal requirements) or even on China.

In Europe, government regulations are forcing automotive OEMs to reduce $CO_2$ emissions of their 'fleet average' emissions to meet the overall EU fleet target of 95g of $CO_2$ per kilometre by 2021. For 2020 the target is also 95g of $CO_2$/km. However, the EU is phasing in the target by counting the best 95% of fleets in 2020, before counting 100% of vehicles from 2021.

The fleet targets for each OEM are actually more nuanced as each manufacturer group gets its own individual target depending on the average mass of the vehicle fleet they sell within the EU. As a volume OEM such as FCA predominantly sells smaller vehicles, its fleet average target is slightly

lower at 91g/km. Conversely, for BMW, a premium OEM that tends to sell larger, heavier cars, a target of 101g/km will apply. To complicate things further, these targets are actually fluid, calculated based on the exact product mix of sales in any particular year.

However, the provisional EU fleet average for 2018 was 120g/km, indicating that OEMs are likely to miss targets by a long way.

To bring their fleet average down, OEMs are applying varying degrees of hybridisation and EV offerings. Toyota is already well placed in this regard with a hybrid version of each model, for example.

Nonetheless, some OEMs are potentially facing huge fines for each 1g/km over the target, which is €95 multiplied by EU sales volume. It has been estimated that VW may face a fine of as much as €1.4bn in 2021. PSA Group could be fined as much as €667m in 2021.

FCA could in theory face a fine of as much as €2.5bn in 2021. However, FCA has pooled $CO_2$ credits from zero-emission OEM Tesla for €1.8bn in a two-year deal to help meet $CO_2$ targets. Some environmentalists are understandably not happy about this 'greenwashing', but FCA clearly believes it makes business sense to pay €1.8bn, albeit to a rival, to help avoid an even bigger fine.

But offering low emissions vehicles is not enough. The fleet average is based upon vehicles actually sold, so OEMs must actually sell those low emission vehicles. If they do not, OEMs could in theory be forced to cap the sales of higher polluting vehicles as it will potentially cost more in fines to sell them than they would gain in profit per vehicle. The level of fines set by the EU was intended exactly in this way: to be punitive so as to prevent OEMs 'just paying the fines'.

The consumer shift away from diesel has resulted in a higher percentage of petrol vehicle sales, which has actually increased fleet $CO_2$ emissions. Furthermore, there is also a consumer trend towards purchasing more SUVs and crossovers, which are heavier, less aerodynamic and thus have higher $CO_2$ emissions. All of which makes the targets even harder to reach.

OEMs could face even more fines in future as the EU has also confirmed a tightening of emission standards by a further 15% by 2025, and around 35% by 2030.

***EU fines for OEMs are estimated by Ultima Media Business Intellgence to reach €2bn in 2020 and €5bn in 2021***

This level of penalties will hit the earnings of the entire automotive industry hard – and, somewhat ironically, will likely reduce the OEMs' ability to invest in emission reduction technology.

In the US, the Corporate Average Fuel Economy (CAFE) is a standard set by previous administrations. In 2018, the Trump administration proposed to "rollback" and freeze the target at 43 miles per gallon (~127g CO2/km) for 2021 and not continue upwards to the previous target of 52mpg (~105g CO2/km) by 2025. The sudden regulatory change in emission targets demonstrates the risk OEMs take in investing in low-emissions technologies, especially if the goalposts suddenly change.

In China, the Corporate Average Fuel Consumption (CAFC)) limit for passenger cars will be 5 litres per 100km in 2020 (which converts to ~116g $CO_2$/km), and then 4 litres/100km in 2025 (~93g $CO_2$/km).

Although not related to $CO_2$ emissions and climate change per se, after 1st July 2019, the government implemented China stage VI emission standards for all new vehicles. These relate to particulate emissions and public health and are some of the strictest in the world. These applied across 15 provinces and municipalities initially, including Beijing and Shanghai. From 2020, the regulations will apply to all of China. All existing vehicles on the roads must now also comply with China stage V emission standards.

Like in the EU, the extra cost of making vehicles compliant for Chinese markets has made it harder to sell volume models with slim margins, and OEMs have largely had to absorb the costs as consumers have been unwilling to pay extra.  Generous Chinese state subsidies have been very effective at encouraging EV uptake. However, in June 2019, the China Ministry of Finance announced it would reduce its EV state subsidies by half from 50,000 RMB ($6,000) to 25,000 RMB ($3,000) per vehicle to encourage innovation. It also increased the minimum range for the subsidy: BEVs with a range of fewer than 250km will no longer receive any subsidy. For 2020, the subsidies are expected to be removed completely. China's carmakers will likely respond by increasing the prices of their EVs correspondingly.

## 3.5 Electrification Poses Technological Risk For The Automotive Industry

The approaching regulatory targets have compelled OEMs to accelerate the electrification of their fleets. However, EVs currently cost an average of around $12,000 more to produce than the equivalent ICE vehicle, costs which OEMs find hard to pass to consumers. EV subsidies vary around the world with major tax incentives in Norway, UK, US and China to encourage EV uptake. Of course, over time prices will fall. However, we expect that this transitional period for OEMs will seriously hit profitability for at least the next five years before EVs become mainstream and real economies of scale can be applied. Until then, OEMs may well be forced to absorb those losses.

And consumers are unsure what vehicles to buy. Government statements about banning the sales of petrol (and especially diesel) vehicles between 2030 to 2040 have confused consumers. Many expect that ICE vehicles may soon be heavily penalised, depreciate rapidly and quickly become obsolete. However, hedging their bets with a hybrid is expensive, while the driving range of full EVs is not good enough yet to convince many consumers concerned with 'range anxiety'. Those customers are waiting until the technology matures and charging infrastructure is in place rather than risk being early adopters that back the wrong horse.

So from now until 2024-2025, the push to electrification is being forced largely by regulation rather than by the open market (hence the EV subsidies in many countries). But beyond 2025, as prices fall, the adoption of EVs will become predominantly consumer driven by the lower running costs and total cost of ownership (TCO) of electric vehicles compared to internal combustion engines.

Until then, there is this bizarre potential scenario where OEMs may even have to cap their own sales of profitable ICE vehicles and be compelled by regulation to manufacture and sell EVs at a loss.

Interestingly, this past August both GM and Volkswagen announced they would no longer sell hybrid vehicles in the US. Hybrids were always intended as an intermediate stopgap, but increasingly investments will now shift to fully electric vehicles. This demonstrates how OEMs are having to accelerate the shift to full electrification.

## 3.6 Re-Tooling Of Manufacturing Plants Poses Investment Risk For OEMs

The total costs of electrification are significant across the value chain, and particularly for manufacturing electric battery and vehicles. To do so at scale requires re-fitting and re-tooling the factories involving considerable investment. And while OEMs may re-tool a plant, there is no guarantee that consumers will immediately buy the resulting EVs.

Nonetheless, carmakers are investing billions to re-tool their production plants. Volkswagen Group's plans have been the most ambitious, including billions to build vehicles on its new all-electric MEB platform across eight plants in Germany, the US and China. In March 2019, VW stated that €1.3bn will also be invested in converting to EV production its German component plants at Braunschweig, Kassel and Salzgitter, with the latter being a specific 'gigafactory' producing batteries.

Interestingly, BMW is applying a slightly different strategy on its production lines by designing them to be able to produce hybrid, petrol and diesel, allowing flexibility behind the investment. This also demonstrates the risk and uncertainty OEMs feel about the wholesale transition to EV powertrains.

## 4.0 Business Model Shifts

### 4.1 Vehicle Price Increases Drive A Shift Towards Used Vehicles

Due to rising emissions regulations, increased technology must be fitted to vehicles. In fact, in regions such as the EU, lower cost small cars with slim margins may become unviable to sell because of the regulations being imposed on OEMs. Often these price increases squeeze out new buyers at the low-end of the market, who are instead choosing to buy used vehicles which they perceive as better value.

Ironically, the very features OEMs are fitting to entice consumers by making vehicles safer, lower emission and more technologically advanced – e.g. driver assistance technologies and infotainment systems – are also having the unintended consequence of driving buyers to lower cost used vehicles instead.

### 4.2 Leasing Also Drives A Shift To Used Vehicles

Increasingly, OEMs have expanded their lease offerings to consumers. After two or three years, the vehicles are returned to the OEM and sold on the used car market with 'as new' warranties. Consequently, there are now a record number of vehicles coming off lease flooding the used car market, which depresses the prices of used vehicles. And these 'as new' vehicles are therefore perceived by buyers as having a more attractive price proposition than the OEMs' own new cars. Once again, this is an unintended consequence of the manufacturers' own sales strategies.

### 4.3 Shared Mobility Drives A Shift Away From Ownership

Millennials, often with student debt and much reduced spending power than previous generations, are much less able to purchase big ticket items such as cars. This results in a dwindling, older demographic which is willing and has the means (and credit rating) to purchase a vehicle – but which is not being replaced by the younger cohort. Ride-hailing apps such as Uber and Lyft have led some people, especially younger, environmentally conscious city-based millennials – the 'on-demand generation' – to question the entire need of owning a vehicle. For younger people, a driving licence has become much less of a milestone in life and car ownership less important as a status symbol.

## 5. Conclusions

### 5.1 What Do We Expect To See Happen Over The Coming Few Years?

The indications are that the prospects for the automotive industry are uncertain at best and the overall outlook is currently negative. However, there are many reasons to be optimistic further ahead.

- After terrible automotive sales in H1 2019, we predict a slight recovery in H2 2019. However, along with a 2.7% decline for global sales in 2019, our outlook for 2020 and 2021 is still negative, while we don't expect sales volume to surpass 2017 highs until after 2025 (see Figure 1). That is around the time we expect EVs to achieve price parity with ICE technologies (at least in the EU, while in North America it is likely to come later around 2028). By then we also expect the global macroeconomic climate to have improved, with increasing population growth and rising middle classes in emerging markets counteracting the stagnating or falling demand in western markets.

- We expect further industry consolidation of OEMs with more M&A activity likely. The much-touted merger of Renault and FCA may have failed thus far, but it demonstrated the necessity to increase economies of scale to invest in new technologies. VW has also stated it is interested in a stake in Tesla to leverage Tesla's battery expertise.

- Likewise, there will be increasing joint ventures, powertrain and platform sharing etc. to spread the huge R&D costs of electrification, as well as AV technologies, over which OEMs must compete with the resources of Waymo, owned by Alphabet, the parent company of Google. Ford using VW's electric vehicle MEB platform, and collaborating on autonomous vehicles (AVs) are prime examples. Audi will also reportedly join Daimler and BMW's alliance on AV technologies.

- The operating margins of 4-8% that OEMs have been enjoyed over the past decade will be diminished and under considerable downward pressure from 2020 to 2025 as the widespread industry transition to electrification gathers pace.

- If sales continue on a downward trajectory, then there will inevitably be more plant closures and job losses.

- The domino effect of OEM cuts will apply considerable pressure on tier suppliers e.g. to improve EV powertrain performance – potentially also impacting tier supplier margins.

- OEMs' bottom lines will be hit very hard. Many will have to pay fines for breaching $CO_2$ emissions targets, possibly cap sales of higher emitting ICE vehicles and also reduce the price of hybrid and electric vehicles to incentivise consumers.

However, from this very uncertain transitional period come great opportunities.

## 6. Opportunities Ahead

- The astonishingly bright future of new technologies on the horizon has huge business potential, hence why OEMs, despite current industry woes, are investing heavily in CASE technologies. Tomorrow's vehicles will be very different to today's and thus provide a much larger differentiation to previous models. This should make used and off-lease vehicles seem much less attractive, reducing the current haemorrhaging of new vehicle sales.

- Transformation, even when forced, can be healthy. The 'dieselgate' scandal has actually had a positive effect upon VW as it has used the crisis to completely reorient its product range to electrification. In March 2019, VW stated that the group plans to launch almost 70 new electric models with investment in this area alone amounting to €6bn reaching a total of more than €30bn by 2023.

- The simplification and commodification of the powertrain in EVs makes the prospect of new OEM entrants more likely. Tesla, Dyson and the raft of new Chinese EVs destined for launch soon indicate that the legacy OEMs are not going to dominate as they once did. One example is Rivian, which is developing electric SUVs and pick-up trucks.

- As many OEMs have demonstrated, from Ford to FCA to VW, increasing the proportion of sales toward higher margin SUVs improves overall profitability, and support investments in new technology.

- OEMS will increasingly need to make profits by maximising non-core business operations, i.e. leasing, car finance, subscription services, value-added services and exploiting big data produced by connected cars. Although the monetisation of data from connected cars has yet to reap significant revenues, many brands are expanding service offerings based around data. We could imagine a world where the vehicle is a break-even or even a loss-leading product in which consumers 'subscribe', locking into the OEMs' ecosystem of add-on services.

- Investment in autonomous vehicles has totalled more than $100bn and will remain a major focus, even if their arrival on a mass level may be further away than once predicted. In July, Ford and Volkswagen announced they would expand their alliance with VW investing $2.6bn in Argo AI, an autonomous vehicle start-up that Ford had previously invested $1bn into in 2017.

***It is clear the future is going to be Shared, Autonomous and Electric Vehicles (SAEV)***

Nonetheless, even if there is an uptick in the macroeconomic climate and trade wars are pacified, the multitude of other restraining factors will still remain, which indicates that there are profound structural changes occurring in the automotive industry.

The OEMs and tier suppliers that will succeed will be those that embrace the change wholeheartedly and grasp those new business opportunities.

## 7. Appendix



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