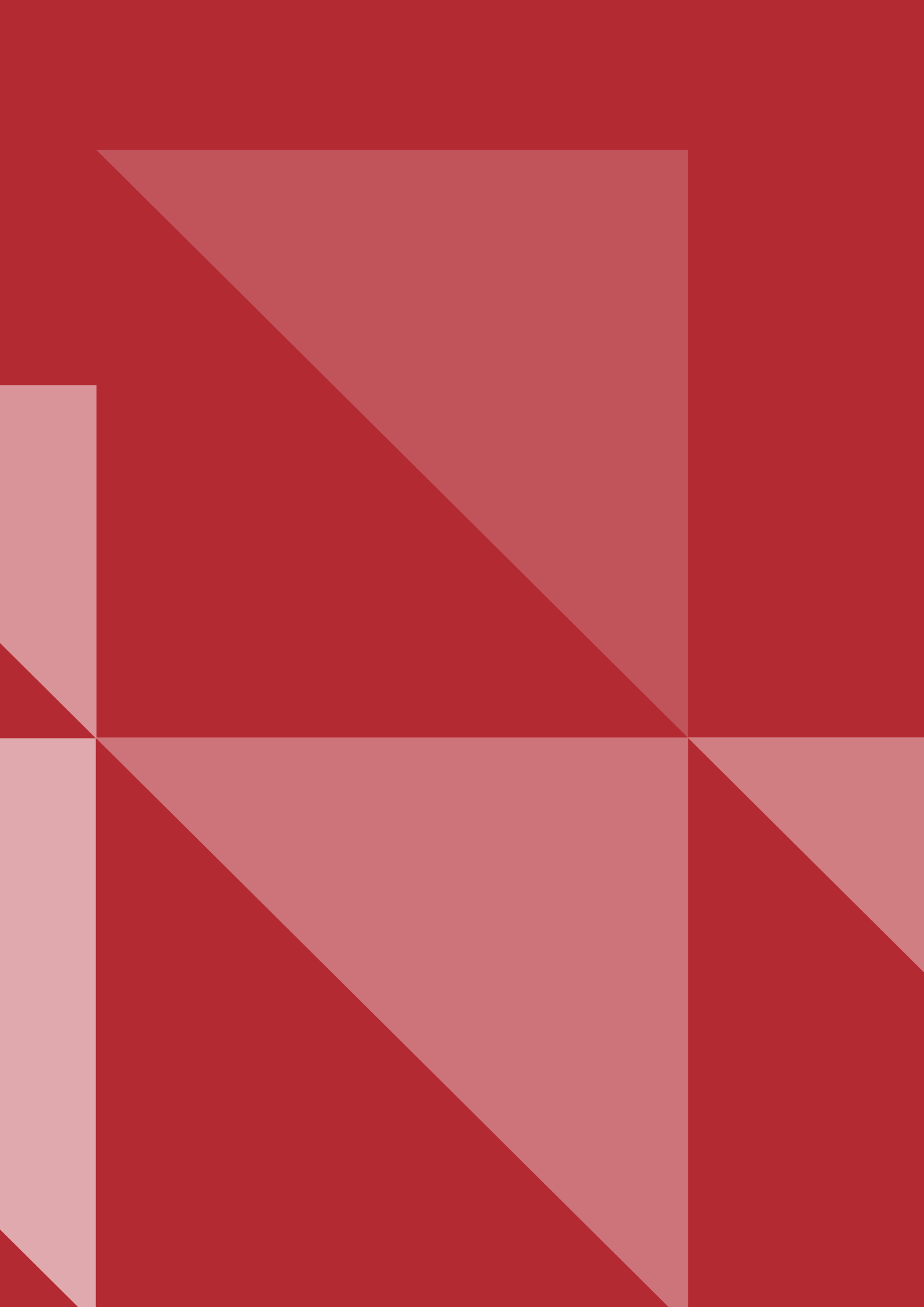# No room for passengers

Are auto manufacturers reducing emissions quickly enough?
Executive summary

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The full report is available to all CDP signatories. The report can be accessed through the investor data tab on the CDP portal or by contacting CDP at investor@cdp.net.

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Linking emissions-related metrics to earnings

▼ We launch our new 'Super-League Table' which ranks companies based on a number of emissions-related metrics which in aggregate could have a material impact on company performance

▼ Leaders are: Nissan, Toyota, and Renault

▼ Laggards are: Tata Motors (owner of Jaguar Land Rover), Hyundai, and General Motors

Overview

In this report, we launch our new Super-League Table (SLT) for the global automobile original equipment manufacturers (OEMs).

We rank those companies that responded to CDP's Climate Change questionnaire, which account for 83%[1] of the global auto market by sales volume, based on a number of different emissions-related metrics. When taken in aggregate, we believe these metrics could have a material impact on a company's earnings in a global auto market where emissions regulation is tightening and there are significant penalties for non-compliance.

We highlight those companies that are best positioned to benefit from this regulatory change and those that will struggle without adapting their existing business models.

Scope of report: emissions

Our SLT focuses on three key areas:

▼ **Fleet emissions:** these account for 75% of total emissions for the auto industry[2].

▼ **Advanced Vehicles:** Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs) and Fuel Cell Vehicles (FCVs) which will increasingly contribute to lowering total emissions.

▼ **Manufacturing emissions:** these account for 20% of total emissions, split roughly as 17% supplier emissions and 3% auto OEMs own manufacturing emissions (mostly assembly).

Scope of report: geographies

Our study spans the three largest auto markets globally, which together account for 75% of global auto demand.

▼ **The EU (22% share):** a leader in emissions regulations, it has by far the lowest fleet-wide emissions (on a per unit basis). Vehicle sales in the EU have been declining over the last decade or so.

▼ **The US (25% share):** by far the highest fleet-wide emissions (on a per unit basis). US consumers demand more super-sized powerful cars. Fleet emissions rules and penalties have been in place since the 1980s, though there has been a culture of non-compliance, with penalties seen as an ongoing business cost that is passed on to consumers. This is set to change under the new EPA regulations that kick in from a penalty perspective in 2016.

▼ **China (28% share):** is the largest auto market globally, having tripled in size from 2008-2013. It could be an explosive market for Advanced Vehicles if it becomes more stringent in its megacity Low Emission Zones (LEZs). The Chinese government has very aggressive targets for total sales of BEVs and PHEVs of 5 million units by 2020 – achieving this would imply sales of approximately 2 million per annum by 2020, we estimate, which roughly equates to total annual car sales in the UK (or India).

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1 Derived from Bloomberg data but adjusted by assigning total sales made by Chinese joint ventures (JVs) to their respective non-Chinese OEM partner (see fleet emissions summary).
2 Averaged over the auto OEMs that responded to the CDP Climate Change Questionnaire

Leaders and laggards

14 of the top 16 auto OEMs globally (excluding China) responded to CDP's 2014 questionnaire, and together represent 83% of the global auto market and US$844 billion in market cap. The non-responders were Suzuki (10th, 3.4% share) and Kia (11th, 3.2% share). The highlights of our analysis are as follows (see condensed SLT below):

▼ All four of the Japanese OEMs (Nissan, Toyota, Mazda and Honda) were ranked in the top half of the table; three of them were in the top four.

▼ Nissan was ranked first. It scored consistently high across all metrics, except for EU fleet emissions, where it received an E-grade (it only has small sales exposure here so its EU weighting in the SLT is minimal). It scored an A-grade for Advanced Vehicles – it has the leading model in our view, the Nissan Leaf (a BEV).

▼ Toyota was ranked second. It was the only OEM to score an A-grade for both Overall Fleet Emissions and Advanced Vehicles, demonstrating its clear leadership in these areas. It has been a pioneer of hybrid technology and was recently the first OEM to launch an FCV with a view to mass manufacturing. It missed the top spot in the SLT as it does not disclose supplier emissions to CDP and consequently we could not calculate certain manufacturing emissions metrics (it received a D-grade for Manufacturing Emissions).

▼ Renault was ranked third. It was the clear leader for Overall Fleet Emissions; however, it is the only OEM with no US exposure and almost no Chinese exposure (only 1%). Thus, its A-grade for EU Fleet Emissions carried 99% weight in determining Overall Fleet Emissions Rank.

Condensed summary of our new Super-League Table (SLT) for the auto OEMs

SLT Rank	Company	Country	Overall SLT Score	Global market share (2013) (i)	Overall Fleet Emissions Grade	Advanced Vehicle Grade	Manufacturing Emissions Grade (including suppliers)	Manufacturing Emissions Target Grade (ii)	CDP Performance Band (iii)
1	Nissan	Japan	4.1	5.9%	B	A	B	A	A
2	Toyota	Japan	3.6	10.6%	A	A	D	E	A
3	Renault	France	3.6	4.0%	A	C	D	E	A
4	Mazda	Japan	3.3	1.4%	A	E	C	A	B
5	Daimler	Germany	3.3	2.4%	B	D	A	C	A
6	Volkswagen	Germany	3.2	14.8%	C	C	A	E	A
7	Honda	Japan	3.1	5.7%	B	B	D	E	A-
8	BMW	Germany	3.1	3.1%	D	C	A	E	A
9	PSA Peugeot Citroën	France	2.9	3.2%	C	D	B	A	A-
10	Ford	USA	2.9	7.0%	D	B	E	C	D
11	FCA	Italy	2.3	4.9%	E	B	B	B	A
12	General Motors	USA	2.2	12.3%	E	A	E	D	A
13	Hyundai	South Korea	2.0	5.6%	D	D	C	E	B
14	Tata Motors	India	2.0	1.7%	C	n/a	E	E	n/a
		Total		82.8%					
% of total industry emissions (iv)					75%		20%	3%	
Weighting in determining overall SLT Sector Score (and SLT Rank)					50%	25%	15%	5%	5%
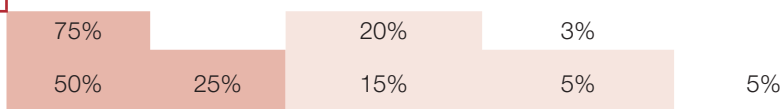
Notes:
(i) Derived from Bloomberg data but adjusted by assigning the total sales from each Chinese JV to the respective non-Chinese OEM (see Fleet emissions summary chapter).
(ii) Assessment of auto OEM's own manufacturing emissions target. This is a Scope 1 and 2 target and excludes suppliers emissions.
(iii) This is the annual CDP climate performance band applied across all 1,749 companies that respond to CDP. It uses a consistent approach for all sectors, and in the past has focused more on Scope 1+2 emission.
(iv)Total emissions averaged over the OEMs in our study: does not sum to 100% as the table does not take account of a small amount of Scope 3 emissions such as business travel - these account for 5% of overall emissions

- The German OEMs were all placed in the top-mid range table. Daimler was fifth, VW, the world's largest auto OEM, is ranked sixth and BMW eigth.

- Daimler (owners of Mercedes and Smart cars) scored a B-grade for Overall Fleet Emissions due to an impressive track record of fleet emissions reductions in Europe. We estimate that if this progress is maintained its fleet will be one of the most efficient in the EU by 2021. Smart cars will increasingly contribute.

- We note that the rankings in a large portion of the table are very tight. There was a narrow range for the Overall SLT Score between fourth and tenth places. For instance, if French OEM, PSA Peugeot Citroen which ranked ninth had received a B-grade rather than a D-grade for Advanced Vehicles, it would have been propelled up to fourth place. This suggests that there is everything to fight for amongst the OEMs. Technological advancements could see a dramatic change in the rankings in future iterations of our SLT.

- The US OEMs were both ranked towards the bottom of the SLT, which is not surprising given their market-leading positions in (and sales exposure to) the US market. US consumers tend to demand more super-sized cars (which have notably higher emissions). GM was third from bottom – it was graded E for Overall Fleet Emissions but was saved from bottom rank by its A-grade for Advanced Vehicles. Ford was ranked tenth (or fifth from bottom).

- Tata Motors is the bottom-ranked OEM. This is partly due to an incomplete response to CDP's questionnaire but also due to its high-emitting Jaguar Land Rover brands coupled with the fact that it is the only OEM in our analysis that is yet to release an Advanced Vehicle.

- FCA was the worst performer from a fleet emissions perspective, which is perhaps not quite so surprising given that its US-based Chrysler division has a high-emitting vehicle range, coupled with the fact that FCA has consistently made one of the lowest investments in R&D over a number of years. That said, FCA shows some promise with a B-grade achieved for Advanced Vehicles.

- Hyundai was the most consistent poor performer, with D-grades for its fleet emissions in each of the EU, US and China, and also for its Advanced Vehicle Grade. It was hardly surprising that Hyundai ranked second from bottom.

- The Japanese OEMs may have performed even better had our analysis extended to the Japanese market (which like the EU is a relatively low-emission market); a lack of credible data prevented this. That said, they each have more than 50% sales exposure (before our normalization) to the geographies covered in this report.

Penalties

- General Motors and FCA are the only two OEMs that are at notable risk of a penalty in both the EU and US; these penalties could potentially equate to a combined US$1.7 billion (33% of EBIT[3]) and US$574 million (15% of EBIT) respectively.

- In addition, we estimate that Ford is at risk of a penalty in the US of US$889 million (or 16% of EBIT).

- BMW, Volkswagen, Daimler, Hyundai, and Nissan are all also at risk of a penalty in either the EU or US.

- The potential penalties facing OEMs at risk of missing their targets are CDP estimates. They do not take into account any credits available to OEMs to assist the transition of their fleets to meet regulatory targets. The penalties are for illustrative purposes only.

- We note that CAFE fleet emissions penalties have been levied in the US since the 1980s and it is not uncommon to see OEMs pay fines into the tens of millions of US dollars. We note that recently in 2011, Daimler paid a fine of US$16 million and Tata Motors paid a fine of US$14 million. The highest fine paid so far has been US$90 million by Daimler-Chrysler (as it was then) in 2006.

See the Fleet emissions summary chapter for more detail on the potential penalties.

Linking our findings to investment choices

We recognize that investment decisions are based on a multitude of different factors and that some of these factors can be misaligned with emissions reductions.

Our SLT rankings are not intended as definitive winners and losers for investment purposes, more as a proxy for business-readiness in an industry where there is significant regulatory tightening across all major vehicle markets.

We would flag that companies towards the bottom of our SLT are possibly higher risk investments than those towards the top. However, we appreciate an investment such as Tata Motors, a leader in the fast growing SUV segment of the vehicle market, could well be able to pass penalties on to consumers of its premium vehicles without a major impact on earnings. On this basis, investors might view Tata Motors as a high(er) risk but potentially high reward investment.

A summary of key areas, associated metrics and relative weighting in the Super-League Table

Area in Super-League table	Link to company earnings	Metrics	Weighting
Fleet emissions	Significant financial penalties for non-compliance.	(i) EU fleet emissions (gCO_2/km) (ii) US fleet emissions (mpg) (iii) China fleet emissions (L/100km)	50%
Advanced Vehicles	Potentially explosive market growth opportunity, in particular in China. Early movers will benefit. Laggards may miss out.	(i) Technical grade (ii) Sales momentum/first mover grade (iii) other considerations i.e. technology collaborations, domestic market strength	25%
Manufacturing emissions	Efficient manufacturing can enhance financial performance. Manufacturing emissions (intensity) reduction is a proxy for increased manufacturing efficiency	(i) Manufacturing emissions intensity (ii) Reduction in intensity 2011-13 (iii) Supply chain engagement (by % spend) (iv) Emissions reduction target analysis	20%
CDP climate performance band	A good annual CDP score is a proxy for a generally well run company. Well run companies are better placed to succeed in a changing marketplace.	(i) CDP 2014 climate change performance band	5%

Source: CDP

Methodology

We score each OEM based on a number of different metrics which are first ranked and then graded A to E, with A being best and E the worst.

The metrics can be categorised into three key areas:

1) Fleet emissions: we analyze fleet emissions for each OEM across three major auto markets: the EU, the US and China. We use historic emissions data to assess whether each OEM is on track or off track to meet the regulatory emissions targets in each of these markets; and if off track, the potential financial impact.

2) Advanced Vehicles (AVs): we perform a detailed review of most available models of BEVs and PHEVs globally. We also consider a number of other factors including each OEM's exposure to FCVs, the commitment of their domestic markets towards charging station build-out and consumer subsidies, and sales momentum of BEVs, PHEVs and FCVs per OEM.

3) Manufacturing emissions: we assess each OEM across four key metrics related to manufacturing emissions. The first relates solely to each OEM's own manufacturing emissions (known as Scope 1 and Scope 2 emissions), the second relates solely to their suppliers' emissions (known as Scope 3 – supplier emissions), and the remaining two relate to manufacturing emissions as a whole.

Each of the above focus areas has a separate chapter within this report, and the precise methodology for how we rank and grade each metric is described in the relevant chapter.

In addition to the three key areas, we also include CDP's climate performance band for 2014 in the SLT. It scores the 1,749 companies that respond to CDP's main questionnaire based on their climate change readiness. A high score can infer a well-run business with a forward-looking management team, not just focused on the short term.

The table on the previous page summaries the key areas of the SLT and the weightings we have assigned to each area, according to our sense of their potential impact on company performance.

In determining the Overall SLT Score and therefore the SLT Rank, we assign a number (1 to 5) to each of the grades for the key areas above (and the CDP climate performance band), with A=5 down to E=1. We then apply the weightings in the table above to each numbered grade and aggregate them to arrive at the Overall SLT Score and Overall SLT Rank.

Note that the Overall Fleet Emissions Grade is an exception to the above procedure. Rather than applying the weighting to the numbered grade, we instead apply the weighting to the Overall Fleet Emissions Score. As fleet emissions carry so much weight (50%) in the SLT, we believe using the Overall Fleet Emissions Score (rather than the grade) gives a more accurate result.

For further study

Interesting areas for further investigation include:

The cost per OEM of complying with the fleet emissions targets in each region and whether they would need to increase their R&D spend to meet these targets.

An extension of our study to include light commercial vehicles, as well as trucks (and heavier vehicles) where relevant.

Different profiles for forecasting reductions in fleet emissions rather than assuming a constant percentage reduction across the forecast periods for all OEMs. Such profiles might include a period of steady emissions reductions followed by a period of faster reductions as new technologies are implemented. One could also look to vary the emissions reduction profile for each OEM and link it to forecast/targeted R&D spend and the release of new technologies, model renewal cycles or changes to average fleet mass.

Adding a consumer review score for the main BEVs and PHEVs on the market as another component in determining the Advanced Vehicle Grade.

Further work on the component suppliers and each OEM's exposure to other components used to optimize existing combustion engine technology, for example, super-chargers, fly-wheels etc.

An extension of the fleet emissions study to other regions including Japan, India, and Latin America, and the level of potential penalties for non-compliance, if applicable.

Incorporate a 'lobbying' grade into the SLT to assess which companies are most involved in shaping the future.

Expand the study to include other pollutants arising from vehicles, such as nitrogen oxides, fine particulate matter, volatile organic compounds, carbon monoxide, and sulphur dioxide, amongst others.

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