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Executive Summary

- The climate strategies of the world’s largest automakers are undermining a 1.5°C-aligned transition towards zero-emission vehicles. The finding comes from InfluenceMap’s new interactive Automotive Climate Tool that combines a leading analysis of the automotive sector’s climate policy engagement, with industry-standard data from IHS Markit (March 2022 dataset, first available in April 2022) on automakers’ zero-emissions vehicle production strategies.

- Automakers’ zero-emission vehicle production is not on track to meet the International Energy Agency’s (IEA) 1.5°C scenario. Based on InfluenceMap analysis of IHS Markit data, the entire global automotive sector will need to increase annual zero-emission vehicle (ZEV) production (either battery electric vehicles or fuel cell electric vehicles) by 80% from 2029 to 2030 to reach the IEA’s 1.5°C-aligned 2030 target on ZEVs. This research finds that only Mercedes-Benz (56% in 2029) and Tesla (100% in 2029) are on track to meet the IEA’s 1.5°C trendline for zero-emission vehicle production globally (57.5% of all global sales by 2030) based on recent forecasts.

- At the same time, automakers remain a major blockage to government policy aiming to accelerate the shift to zero-emission vehicles. Eight out of twelve companies analyzed receive a final grade of D or D+ in InfluenceMap’s analysis of their climate policy engagement alignment with the Paris Agreement. The sector’s climate policy engagement is characterized by high-level supportive statements for climate action, contrasted with strategic opposition to regulations to phase out internal combustion engines.

- Automakers lagging in the transition to battery electric vehicles have the most negative climate policy engagement. Laggard automakers, such as Toyota (D) and Nissan (D+), which are forecast to have the lowest percentage of zero-emissions fleet-wide vehicle production in 2029 (14% and 22% respectively), also have the most negative climate policy engagement. In contrast, leading automakers in forecast battery electric vehicle production are most positively engaged on climate, led by Tesla (B) and Volkswagen (C), with Tesla’s positive advocacy representing best practice for the sector.
This analysis identifies a trend of automakers embracing positive climate legislation as they increase battery electric vehicle (BEV) production, like Volkswagen. However, BMW Group, Mercedes-Benz, and Stellantis are outliers to this trend. Despite increased BEV ambitions in 2021-22, all three companies have strategically opposed key policies to phase out internal combustion engine-powered vehicles (all scoring a D+ in their climate policy engagement) while stating top-line support for climate action.

Ambitious climate legislation is a key driver for automotive electrification and a requirement for decarbonization. Regions with the most ambitious climate legislation for the automotive industry, like the EU, are leading on forecasted battery electric vehicle (BEV) production, whereas regions with less ambitious climate policy, such as Japan, are lagging on forecasted domestic BEV production. Moreover, as hydrogen-powered fuel cell vehicles (FCEV) are forecast to only reach 0.1% of global light-duty vehicle production in 2029, climate regulations promoting battery electric vehicles appear crucial to decarbonizing the sector.

Japanese automakers are the least prepared for a zero-emissions transition and are advocating most forcefully against it. The three automakers analyzed with the lowest proportion of forecast global zero-emissions vehicle production in 2029 are all Japanese (Toyota - 14%, Honda - 18%, and Nissan - 22%). All three companies score D to D+ in their climate policy engagement, stating top-line support for climate policy, while strategically opposing key policies to phase out ICE vehicles and decarbonize road transport. All three are forecast to strategically focus their global production on ICE vehicles (including hybrids and plug-in hybrids) over battery electric vehicles (BEVs).

Europe is leading on battery electric vehicle (BEV) production, while the US is lagging. By 2029, 59% of light-duty vehicles produced in the EU are forecast to be BEVs, compared to only 35% in the US. This EU forecast correlates with automakers rapidly electrifying their fleet to meet the EU's proposed 2035 zero-emissions CO2 target. In contrast, with no binding federal ICE vehicle phase-out date and less stringent emissions standards, automakers are falling behind on electrification in the US. For example, in 2029, only 3% of Toyota's US production is forecast to be BEVs, compared to 49% in the EU.
Growing SUV production threatens automotive sector decarbonization. InfluenceMap analysis of IHS Markit data finds that global SUV production is forecasted to increase from 39% to 47% of all light-duty vehicles from 2020 to 2029. Increased vehicle size is a major driver of global transport emissions, with all twelve automakers analyzed set to produce a higher proportion of SUVs globally in 2029 than in 2020, canceling out many of the emissions reductions from higher battery-electric vehicles production.

Global automotive electric vehicle ambitions are not keeping pace with global climate targets. InfluenceMap’s Automotive Climate Tool’s simplified model combines EU emissions data and future vehicle production forecasts to estimate that by 2029, global real-world emissions for light-duty vehicles may be significantly higher than what is needed for even a 2°C pathway.
Glossary

- **BEV** = Battery electric vehicle: A vehicle operating solely on an electric motor instead of an internal combustion engine.

- **FCEV** = Fuel cell electric vehicle: A vehicle powered by a fuel cell, typically using hydrogen as fuel, to power an onboard electric motor.

- **ICEV** = Internal combustion engine vehicle: An ICE vehicle is powered by a combustion engine powered by fossil fuels (e.g. gasoline or diesel).

- **PHEV** = Plug-in hybrid electric vehicle: A hybrid vehicle combining an internal combustion engine with an electric motor whose battery pack can be recharged by plugging a charging cable into an external power source. PHEVs are not included as zero-emission vehicles, as they produce CO2 tailpipe emissions when not in all-electric mode.

- **SUV** = Sports Utility Vehicle.

- **ZEV** = Zero-emissions vehicle: A vehicle that produces no CO2 tailpipe emissions, including battery electric vehicles (BEVs) and hydrogen-powered fuel cell electric vehicles (FCEVs).

- **Corporate Climate Policy Engagement** – In 2013 the UN issued the Guide for Responsible Corporate Engagement in Climate Policy which describes a range of corporate activities which can be defined as engagement. These range from advertising, social media, public relations, sponsoring research, direct contact with regulators and elected officials, funding of campaigns and political parties and participation in policy advisory committees. The phrase “policy engagement” is used interchangeably with “lobbying” in this report.

- **Organization Score** – Within InfluenceMap's scoring system this is a measure of an organization's engagement against Climate Policy benchmarks such as the IPCC. Above 75 indicates support, below 50 indicates increasing opposition. Applies to all organizations, both corporations, and influencers.

- **Relationship Score (0-100)** – Within InfluenceMap's scoring system this is a measure of the aggregate of a corporation's climate policy engagement via industry associations it has links to. Applies only to corporations. This incorporates a relationship link metric which tempers the impact on the overall score depending on the nature of the relationship between the corporation and that specific industry association.

- **Performance Band (A+ through F)** – Within InfluenceMap's scoring system this is a measure of a corporation's climate policy engagement accounting for its own and its industry associations’ activity on a scale of A through F scale (A = support, F = opposition).
InfluenceMap’s new interactive Automotive Climate Tool combines a leading analysis of the automotive sector’s policy engagement on climate legislation with industry-standard data from IHS Markit (March 2022 dataset, first available in April 2022) on leading automakers’ forecasted production out to 2029. It enables users to track twelve of the largest automakers by volume in ten key sales regions as they compete to align themselves with Paris-aligned trajectories, alongside global data on future forecasted production.

This report summarizes key data from the freely available tool, where data can be broken down by automaker and region. It also includes full company profiles for all twelve major automotive manufacturers, including analysis of their climate policy engagement.

The IPCC & IEA on Decarbonizing Road Transport

Over the last few years, a series of historic climate reports from the IPCC and the International Energy Agency (IEA) have become increasingly clear in their robust policy advice to reduce automotive sector emissions in line with global climate targets. This section overviews the latest research developments and highlights how automakers are strategically transforming their electrification strategies in response.

IPCC’s Working Group III Report

Globally, road transport was responsible for around 16% of global energy-related CO2 emissions in 2019 according to the IPCC’s Working Group III report released in April 2022. Other key findings from the IPCC’s Working Group III report related to road transport include:

- **Transport**: The report found that “meeting climate mitigation goals would require transformative changes in the transport sector” (IPCC AR6, TS-67, 2) as CO2 emissions from transport could grow in the range of 16% and 50% by 2050” (IPCC AR6, TS-68, 23-24), potentially jeopardizing global climate goals as transport emissions have historically grown faster than other sectors.

- **Electric vehicles**: The Summary for Policymakers (SPM) report notes that “electric vehicles powered by low emissions electricity offer the largest decarbonisation potential for land-based transport, on a life cycle basis (high confidence)” (IPCC, AR6, SPM-41, C.8).
**Demand reduction:** The SPM noted that “demand-side options and low-GHG emissions technologies can reduce transport sector emissions in developed countries and limit emissions growth in developing countries” (IPCC, AR6, SPM-41, C.8). The technical summary found that “legislated climate strategies are emerging at all levels of government, and, together with pledges for personal choices, could spur the deployment of demand and supply-side transport mitigation strategies” (IPCC AR6, *TS*-69, 22-24).

**Hybrids:** While the full report recognizes that hybrids can “reduce emissions compared to ICEV by up to 20%, depending on the fuel” [...] “Because HEVs rely on combustion as the main energy conversion process, they offer limited mitigation opportunities”, offering only a “suitable temporary solution”. (IPCC AR6, 10-40, 21-31). It also recognises that “PHEVs may provide greater opportunities for use-phase emissions reductions for LDVs” with their lifecycle emissions between those of their ICEV and BEV counterparts of similar size and performance (IPCC AR6, 10-40, 36-48, 10-41, 1-10). Yet the report noted that “ICEV, HEV, and PHEV technologies, which are powered using combustion engines, have limited potential for deep reduction of GHG emissions” (IPCC A46, 10-43, 25-26).

**Biofuels:** The SPM found that sustainable biofuels “can offer additional mitigation benefits in land-based transport in the short and medium term (medium confidence)” (IPCC AR6, SPM-41, C.8), while the full report notes concerns around the feasibility of biofuels, including the land, water and biodiversity impacts. The technical summary further notes that “In general terms, electrification tends to play the key role in land-based transport” over biofuels (IPCC AR6, *TS*-68, 40-42).

**Vehicle type:** The report found that “if the trend towards increasing vehicle size and engine power continues, it may result in higher overall emissions from the LDV fleet (relatively to smaller vehicles with the same powertrain technology)” (IPCC, AR6 WGIII, 10-41, 47-48, 10-42, 1). This direct link between higher energy usage and increased weight is highlighted in the table.

### Energy consumption of internal combustion engine vehicles (ICEV), hydrogen-electric vehicles (HEV), and battery electric vehicles (BEV) of varied masses (WG3, 10.3, Figure 1)
IEA’s Net Zero by 2050 Report
In 2021, the International Energy Agency (IEA) released its landmark *Net-Zero by 2050 report*, detailing the policies required to meet the Paris Agreement goal of limiting global warming to 1.5°C. Regarding the automotive sector, some of the report’s key findings to reach net-zero by 2050 include:

- Stringent fuel-economy standards and ensuring no new passenger cars running on internal combustion engines (ICEs) are sold globally from 2035 with a rapid shift to more electric vehicles (EVs).

- Recommended policy options such as speed limits, low-emission zones, congestion charges, and low-carbon modal shift policies, including investment in cycling lanes and public transportation.

- The *IEA’s 1.5°C scenario* assumed that to meet net-zero by 2050, 57.5% of all light-duty vehicle sales in 2030 must be zero-emission vehicles (either battery electric or fuel cell electric vehicles).
Global Climate Regulations on Light-Duty Vehicles

Reflecting this emerging guidance, global policymakers have sought to increase regulatory ambitions for the automotive sector in line with Paris Agreement targets. Globally, over 10 national governments have set targets to phase out new ICE-powered vehicles. Major regions, such as the EU and US are also introducing stringent GHG emissions standards, alongside other ambitious policies like the UK's proposed zero-emission vehicles mandate. A summary of key automotive-sector climate policies for three key regions where 11 of the 12 major automakers covered by this analysis have headquarters are outlined below.

<table>
<thead>
<tr>
<th>Region</th>
<th>Key Regulation/s</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>EU CO2 standards for light-duty vehicles, national</td>
<td>The EU CO2 standards for light-duty vehicles set higher emission performance CO2 standards for cars and vans to reduce GHG emissions from the automotive sector. In July 2021, the European Commission adopted proposals to set a 55% reduction target for 2030, and a 100% cut in CO2 emissions from cars by 2035, effectively phasing out the sale of new internal-combustion engine (ICE) powered cars in 2035. Additionally, numerous EU states, such as the Netherlands, Austria, and Denmark, have adopted earlier 2030 ICE-powered vehicle phase-out dates for cars and/or vans.</td>
</tr>
<tr>
<td>Union</td>
<td>ICEV phase-out dates</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>CAFE and GHG emissions standards for cars and trucks</td>
<td>In December 2021, the US Environmental Protection Agency announced the introduction of higher GHG emissions standards for cars and trucks for model years 2023-26 to promote the sale of electrified vehicles and more efficient ICE-powered cars and trucks. Recently updated US Corporate Average Fuel Economy (CAFE) standards also set fuel economy standards for passenger cars and light trucks for 2024-26. The US currently has no federal ICE phase-out policy in place. The Biden administration in August 2021 set a voluntary, non-binding target of 40-50% electric vehicle sales (including plug-in hybrids) by 2030.</td>
</tr>
<tr>
<td>Japan</td>
<td>Fuel economy standards and Green Growth Strategy</td>
<td>Japan’s fuel efficiency standards for new passenger vehicles require an average fleet gasoline-equivalent fuel economy of 25.4 km/L by FY2030. The Green Growth Strategy finalized by the Japanese government in June 2021, targets the electrification of all new passenger vehicles sold by 2035, phasing out non-hybrid ICE vehicles, while still permitting the sale of hybrids and plug-in hybrids.</td>
</tr>
</tbody>
</table>
Battery Electric Vehicles and Automakers’ Climate Strategies

In 2021, battery electric vehicle sales more than doubled from 2020 to reach a record high of around 4.8 million cars sold, around 5.9% of all global sales, with around 2 million additional sales of plug-in hybrid vehicles (2.4% of all global sales). Battery electric vehicle sales currently vary depending on the region. In Norway, the leading market globally, 65% of new car sales were battery electric vehicles in 2021, compared to 9.1% throughout the EU. This compares to new battery electric vehicle sales representing only 3% of the US market in 2021, and 0.9% in Japan.

Automakers’ internal business strategies for electric vehicles in different regions appear to have been increasingly influenced by more stringent climate regulations. For example, the significant growth in BEV sales in the EU in 2021, and numerous manufacturers’ accelerated recent internal EV strategies, such as Stellantis’ March 2022 target to only sell BEVs in Europe by 2030, have coincided with higher ambitious EU CO2 emissions targets, including a zero-emissions 2035 effective phase-out date for ICEV sales.

Building on these increasingly stringent global regulations, at COP26, over six major automakers and 30+ national governments publicly pledged to phase out the sale of new gasoline and diesel-powered vehicles by 2040 globally, and by 2035 in “leading markets”. However, only three (Ford, General Motors, and Mercedes-Benz) of the twelve global automakers analyzed in this report signed the pledge.

As governments globally increasingly accelerate their plans to decarbonize transport in line with the Paris Agreement, major automakers who fail to electrify their fleets risk being left behind. Major investors, such as the Climate Action 100+, are increasingly turning their attention to the automotive sector. Consequently, in 2022, numerous proxy resolutions have been filed at over five major automakers for their perceived inaction on climate, and their direct negative climate policy engagement, or that of their industry associations, e.g. for Volkswagen. Investors are now increasingly recognizing that a failure to rapidly transition towards battery electric vehicles, and a failure to align climate policy engagement with the policies needed to facilitate this shift represents a significant business and regulatory risk for automakers.
Vehicle Policy Engagement and ZEV Strategy

Automakers’ Zero-emission Vehicle Strategies

For the first time, InfluenceMap has compared the climate policy engagement of leading automakers with their real-world zero-emission vehicle strategies using industry-standard forecasted production data by IHS Markit. IHS Markit is a leading automotive data supplier, with its services “used by nearly every OEM, more than 95% of tier one suppliers, media agencies, governments, insurance companies, and financial stakeholders”. Using this data, the graph below shows the percentage of zero-emission vehicles the manufacturers are forecasted to produce by 2029 against InfluenceMap’s climate policy engagement scores. Interactive graphs and data are available on the Automotive Climate Tool.
Key trends are summarized below:

- **Automakers lagging in the transition to battery electric vehicles are the most negative in their climate policy engagement.** There is a clear trend between automakers, such as Toyota, who are forecast to have among the lowest proportional production of zero-emissions vehicles by 2029 in their fleet, and advocacy against ambitious climate policies to promote battery electric vehicles and phase out ICE vehicles. These automakers are clustered on the bottom left-hand side of the graph. Overall, this analysis finds an intimate connection between automakers’ internal production ambitions for zero-emission vehicles and their external climate policy engagement strategies.

- **Leading automakers on battery electric vehicle production are the most positively engaged on climate policy.** As companies align their strategies with science-based policy advice on climate, a transition towards higher forecasted zero-emission vehicles and increased support for legislation and regulation to drive this shift is anticipated. Moreover, some automakers like Volkswagen, which has historically opposed climate policy, have switched its advocacy strategy in 2020-22 to support more stringent climate legislation after introducing more ambitious internal EV targets. Tesla, however, represents best practice for the sector, with 100% battery electric vehicle production still forecast in 2029, and the most positive climate policy engagement. These automakers are clustered towards the top right-hand side of the graph.

Automakers’ Climate Policy Engagement

InfluenceMap maintains the world’s only platform analyzing corporate engagement on climate policy (LobbyMap). A detailed explanation of corporate opposition to climate policy can be found on the InfluenceMap website. Through LobbyMap, InfluenceMap assesses powerful industry groups’ influence on climate policy and their relationships with the companies who fund them.

As part of this report, InfluenceMap has assessed the automotive sector’s global engagement on climate policy. The 12 major automakers included in this analysis are BMW Group, Ford Motor, General Motors, Hyundai Motor, Nissan Motor, Renault, Honda Motor, Mercedes-Benz Group, Volkswagen AG, Hyundai Motor, Toyota Motor, and Tesla. A full breakdown of individual automakers’ climate policy engagement scores is available in Appendix 1.

Five key automotive industry associations— Alliance for Automotive Innovation (US), European Automobile Manufacturers Association (ACEA) (EU), German Association of the Automotive Industry (VDA), Japan Automobile Manufacturers Association (JAMA), and the Society of Motor Manufacturers and Traders (SMMT)—have also been assessed as part of this analysis. Every automaker analyzed in this report, except Tesla, is a member of at least one of these groups. A full breakdown of automakers’ industry association memberships and their climate policy engagement scores is available in Appendix 2. The key findings are summarized below:

- **The automotive sector remains a major opponent of climate policy globally.** Automakers remain opponents of stringent climate regulation, with eight of the twelve analyzed automakers receiving a final letter grade of D or D+. High engagement intensity scores of 25% or higher from every automaker further indicate that the sector is strategically engaged in trying to influence climate policy. The lowest scoring company in the analysis is
Toyota Motor, which receives a grade of D, and appears to be leading global automotive opposition to climate legislation (detailed on its LobbyMap profile here). This reflects Toyota’s apparent negative global strategic engagement in 2021-22 in opposition to ICE phase-out policies, zero-emission vehicle mandates, and higher GHG emissions standards, as well as global advocacy to support policy favoring a longer-term role for ICE-powered hybrid vehicles over battery electric vehicles.

Despite broad opposition for Paris-aligned policy to decarbonize road transport, automakers’ climate policy engagement has broadly improved in 2020-22, with automakers like Tesla and Volkswagen supporting more ambitious climate regulation than their competitors. Since 2020, InfluenceMap has detected a broad improvement in automakers’ global advocacy, with the average climate policy engagement score in the automotive sector increasing. This is primarily due to increased top-line support for electrifying road transport and support for incentives to promote electrified (although not always zero-emission) vehicles, and policies to expand electric vehicle charging infrastructure. Volkswagen in particular has seen a rapid improvement in its climate policy engagement (from D- to C), from 2020 to 2022, reflecting its recent positive advocacy around pro-BEV policies, such as the EU’s 2035 zero-emissions CO2 target for cars and vans. However, electric vehicle specialist Tesla (B) continues to represent best practice for the sector, supporting ambitious GHG emissions standards, zero-emission vehicle mandates, and ICE vehicle phase-out policies across multiple regions. Toyota’s score has also increased from E+ to D in 2021-22: however, this is primarily due to Toyota’s increased transparency around its direct and indirect climate policy engagement, rather than real-world positive improvements in its climate advocacy.

Automakers remain broadly opposed to regulation reducing demand for internal combustion engines (ICE) in line with global climate targets. Despite increased support for electric vehicle subsidies and incentives, automakers continue to advocate against stringent regulations enforcing rapid electric vehicle adoption in line with the Paris Agreement. This includes opposition to regulations that enforce science-based emissions reductions from ICE vehicles (fuel economy and GHG standards) and advocating against policies enforcing increased zero-emission vehicle sales (ICE phase-out and ZEV mandates). Many automakers have also supported a longer-term role for ICE and hybrid vehicles over battery-electric by strategically promoting “technology-neutral” climate policy, and/or the use of e-fuels or biofuels in road transport over rapid electrification of the sector, typically to delay and weaken stringent climate legislation (see InfluenceMap’s recent German Autos Report).

Industry associations representing the automotive industry are spearheading global opposition to climate regulation across major markets. Industry associations representing automakers across major regions (US, EU, Germany, Japan, and the UK) have highly negative climate policy engagement. Globally, automakers have used their associations to aggressively push back against stringent GHG emissions standards, ZEV mandates, and ICE phase-out policies in 2020-22, typically taking more negative climate policy positions than the individual companies. This suggests automakers have strategically used their associations to distance themselves from their sector’s more negative engagement. However, evidence from 2020-22 also suggests some industry groups have become less oppositional in their climate policy engagement. This may be due to increasingly diverse policy positions among their members, with some automakers starting to embrace pro-electrification policies. A full breakdown
of automakers’ memberships to key industry associations, their climate policy engagement scores, and links to their full LobbyMap profiles, are available in Appendix 2.

Europe: Industry associations ACEA and the VDA, and automaker BMW appear to be leading opposition to the EU’s 2035 zero-emissions CO2 standard which would phase out new ICE vehicle sales. Industry association opposition has been led by key industry associations, the European Automobile Manufacturers’ Association (ACEA) and the German Association of the Automotive Industry (VDA), alongside more limited opposition from the Japan Automobile Manufacturers Association (JAMA) (see InfluenceMap’s CO2 emissions standards briefing for more details). BMW’s CEO and current ACEA chair Oliver Zipse has also repeatedly opposed a 2035 zero-emissions target, including in public comments to Politico in March 2022 where he urged policymakers to delay a zero-emissions target until “2040 at the earliest” (BMW’s full LobbyMap profile is available here). Evidence from 2021-22 suggests that Hyundai, Renault, Stellantis, and Toyota also have unsupportive positions towards the EU’s 2035 zero-emissions CO2 target. In contrast, Volkswagen, while previously opposing a zero-emissions target, supported the 2035 target in an October 2021 position paper for the first time. Most positively, a 2021 consultation response from Tesla appeared to support a higher-ambition 2030 zero-emissions EU CO2 target for cars and vans.

US: Alliance for Automotive Innovation, an industry association representing all twelve automakers except for Renault and Tesla, is driving opposition to stringent US GHG emissions and fuel economy (CAFE) standards. In December 2021, the EPA finalized revised national GHG emissions standards for passenger cars and light trucks for Model Years 2023-2026, reversing the provisions of the SAFE rule and tightening MY 2026 standards to more stringent levels than the 2012 rule issued by the Obama administration. In a September 2021 consultation response and a November 2021 presentation from a meeting with the EPA, the Alliance opposed the adoption of more stringent and less flexible GHG emission standards. In other September 2021 public consultation responses, Ford Motor and Hyundai Motor appeared to support a mid-range option, including numerous flexibilities that would potentially weaken the stringency of the proposal. General Motors, Honda, Mercedes-Benz, Stellantis and Toyota called for a similar approach while appearing to oppose higher-range standards. In contrast, Tesla strongly supported the EPA’s higher-range ambition.

Japan: The Japanese automotive sector is broadly opposed to Paris-aligned climate legislation. According to meeting minutes from the METI subcommittee on energy conservation and new energy in April 2021, the Japan Automobile Manufacturers Association (JAMA) advocated for flexibilities such as EV credits and off-cycle credits to meet Japan’s 2030 fuel efficiency standards for passenger vehicles, which may weaken the policy’s stringency. In April 2021, Toyota CEO and JAMA chair Akio Toyoda appeared to oppose a Japanese phase-out of gasoline and diesel-powered cars at a press conference. In March 2021 testimony to Japan’s Ministry of Economy, Trade and Industry (METI), both Honda and Toyota stated opposition to introducing a ZEV mandate in Japan. Regarding Japan’s economy-wide climate targets, on April 2021, Honda’s CEO, Toshihiro Mibe, appeared to endorse Japan’s raised 2030 46% economy-wide GHG emissions reduction target, stating that “While the government’s target is extremely difficult, I believe it is a feasible target from the viewpoint of Japan becoming carbon neutral in 2050”.

THE AUTOMOTIVE SECTOR AND CLIMATE CHANGE | MAY 2022
Zero Emission Vehicle Projections

The following section outlines key insights from InfluenceMap’s analysis of IHS Markit data from global automakers’ light-duty vehicle forecasted production until 2029. This is broken down by type (e.g. SUVs) and technology (e.g. hybrids) and compared with the IEA’s 1.5°C scenario on zero-emission vehicle sales for road transport. Key findings are outlined below, with the full interactive dataset, including for individual automakers, available on the Automotive Climate Tool website.

- **Company zero-emission vehicle production forecasts** are not keeping pace with the IEA’s 1.5°C scenario. The **IEAs scenario** assumed that 57.5% of all light-duty vehicle sales in 2030 must be zero-emission vehicles - either battery electric vehicles (BEVs) (54.6% of sales) or fuel cell electric vehicles (FCEVs) (2.9% of sales) - to meet global Net-Zero by 2050. InfluenceMap analysis of IHS Markit data finds that the entire global automotive sector will need to increase the annual number of zero-emission vehicle sales by 80% (the equivalent of around 25 million more zero-emission vehicles) from 2029 to 2030 to reach the IEA’s 1.5°C-aligned 2030 target. Only Mercedes-Benz and Tesla currently appear to be aligned with the IEA’s 1.5°C trend for zero-emission vehicle production globally, with the ten other automakers forecast to produce significantly fewer zero-emission vehicles in comparison by 2029.

![Automakers' 2029 Zero-Emission Vehicle Forecasts and Climate Policy Engagement Scores](image-url)
• **ICE production continues to dominate.** Despite a shift towards zero-emission vehicles, InfluenceMap’s analysis of IHS Markit data finds that in 2029, 68% of global light-duty vehicles produced will still be powered by internal combustion engines (including hybrids and plug-in hybrids), whereas only 32% of global vehicles produced will be battery-electric, with only 0.1% forecast to be hydrogen-powered fuel cell electric vehicles (FCEVs).

• **Japanese automakers are the least prepared for a zero-emissions transition.** The three automakers with the lowest proportion of forecast zero-emissions production are all from Japan (Toyota at 14%, Honda Motor at 18%, and Nissan at 22%). This aligns with recent reports suggesting that Japanese automakers are the **slowest to embrace electric vehicles**. All three automakers are instead forecast to strategically focus their production on internal combustion engine (ICE) powered hybrids and plug-in hybrids over BEVs. However, this analysis finds that Honda’s (D+) top-line messaging on electric vehicles in 2021-22 has become increasingly positive, which alongside its **newly announced electric vehicle strategy** in April 2022 (not accounted for in the IHS Markit March 2022 dataset used in this report), suggests that it may...
increasingly embrace the EV transition in the future.

- Low Japanese ambition is likely driven by weak Japanese climate regulation for road transport and negative climate policy engagement. Leading Japanese automakers have actively lobbied against stringent domestic climate policy (see above), likely leading to weaker climate regulations for the sector. Consequently, only 14% of produced vehicles are forecast to be zero-emission by 2029 in Japan (compared to 59% in the EU and 35% in the US). Significant domestic ICE-powered vehicles for Japanese automakers in their global production chains means that Japanese automakers are forecast to produce significantly fewer battery electric vehicles globally than their European and American competitors. Weak Japanese climate policy signals may delay the required innovation needed for Japanese automakers to catch up on battery electric vehicles globally.

- Some Japanese automakers promote hydrogen as the future, despite forecasts suggesting that hydrogen-powered vehicles will make up only 0.1% of vehicles produced both in Japan and globally in 2029. Japanese automakers were previously leading global advocates for hydrogen fuel-cell electric vehicles (FCEV), with the Japanese government setting a target of having 200,000 FCEVs on the road by 2025. Despite major automakers such as Honda recently abandoning their last FCEV models, Japan remains a key promoter of hydrogen-powered light-duty transport as part of its ‘Hydrogen Society’ ambitions. However, forecasts suggest that the entire Japanese auto sector is forecast to produce only 8,000 FCEVs in 2029, around 0.1% of all produced light-duty vehicles. Toyota continues to promote hydrogen fuel cell vehicles, alongside using e-fuels in ICE-powered vehicles in Japan, which appears misaligned with their real-world production strategy.
The EU and European automakers are leading on electric vehicles. By 2029, 59% of light-duty vehicles produced in the EU are forecast to be battery-electric vehicles, with 39% hybrids or plug-in hybrids and only 2% ICE-only vehicles, higher than any other major region. Such ambitions are linked to leading EU climate regulations on light-duty vehicles, such as the announced 2035 zero-emissions CO2 target, effectively phasing out new ICEV sales by 2035, with automakers rapidly electrifying their fleets to meet such targets. Despite this, EU SUV production is forecast to increase from 38% to 49% for all light-duty vehicles from 2020 to 2029, with significant negative climate impacts on the sector.

Increased BEV ambitions for BMW, Mercedes-Benz, and Stellantis have not yet translated into positive climate policy engagement. This report identifies a trend of automakers embracing more positive climate legislation as they expand their battery electric vehicle (BEV) production. However, BMW Group (45% BEV in 2029), Mercedes-Benz (56% BEV in 2029), and Stellantis (40% BEV in 2029) appear outliers to this trend. All three automakers continue to oppose key policies to phase-out ICE vehicles and decarbonize road transport, despite leading on forecasted BEV production in 2029. For example, BMW’s CEO, and ACEA chair in 2022, Oliver Zipse, appears to be leading European automaker efforts to oppose the EU’s 2035 zero-emissions CO2 target in 2021-22, while Stellantis’ CEO appeared unsupportive of an effective EU 2035 phase-out date for ICE vehicles in 2022. This is despite a March 2022 Stellantis announcement for 100% of its light-duty sales to be battery-electric vehicles in Europe by 2030, well ahead of the EU’s proposed phase-out. This misalignment between automakers’ rapidly increasing BEV plans and recent opposition to climate policies to phase out ICE vehicles suggests a near-term opportunity for a positive shift in their climate policy positioning.
The US, and US automakers, are significantly behind Europe on forecasted battery electric vehicle production and climate policy 
ambition. Only 35% of all light-duty vehicles produced are forecast to be battery electric vehicles by 2029 in the US, with 33% pure 
ICE vehicles and 32% ICE-powered hybrids or plug-in hybrids. Low ambition is likely partly 
driven by the lack of stringent US climate policy for the automotive industry, with no 
binding BEV targets or ICE phase-out dates in place. Increased US GHG emissions standards 
and CAFE standards are predicted to promote increased BEV sales, although at a significantly 
slower pace than the IEA’s Net Zero 2050 
scenario. Forecasted global BEV production for both Ford (36%) and General Motors (28%) are 
also well behind key European competitors. In 
the US, SUVs are also forecast to increase from 
46% in 2020 to 56% in 2029 of all produced 
vehicles. Combined, SUV, light trucks, and light 
commercial vehicles are forecast to reach 83% 
of all US vehicles produced by 2029, with zero 
small vehicles forecast – resulting in significant 
negative climate impacts.

Chinese BEV sales are forecast to grow more 
rapidly than in the US. In China, BEVs are 
forecast to rapidly increase from 12% of all 
production in 2021 to 40% in 2029 (compared 
to only 35% in the US), while SUVs are 
forecast to increase from 41% to 49% of all 
manufactured light-duty vehicles in China in 
the same timeframe. While InfluenceMap has 
not included a detailed assessment of Chinese 
automakers’ climate policy engagement as 
part of this report, future work will look in more 
detail at the market.
Major automakers are planning to offload ICE vehicles in Africa, India, and South America. In stark contrast to Europe, the automotive industry is forecast to produce only 3% battery electric vehicles (BEVs) in South America, 8% in Africa, and 9% in India in 2029. Even automakers with significant European BEV ambitions, such as Volkswagen, are set to produce few BEVs in these key emerging markets in 2029 (only 3% BEV in South America, 0% in Africa, and 1% in India in 2029, compared to 56% BEV in the EU). Such strategies suggest significant divergence between their electrification and climate policy engagement strategies in different markets. For example, Volkswagen CEO Herbert Diess has consistently promoted BEVs in Europe, yet in a September 2021 interview stated that in Latin America “electric cars will probably not be the solution for climate change, where the natural way forward is to use biofuels which are CO2 neutral, which is still combustion engine. That is why we don’t say we will finish production of [internal combustion engine] cars so soon because we will need them in some parts of the world. Electrification is not the solution in every place”. Limited automaker BEV production plans and weak climate regulations for road transport in such markets may threaten global climate ambitions, including the COP26 pledge to phase out new ICE-powered vehicle sales by 2040 globally.
InfluenceMap’s Automotive Climate Tool includes a simplified model estimating automakers’ future emissions. It combines recent EU emissions data on average emissions values for different vehicle technologies and types for each manufacturer with IHS Markit data on forecasted production. IHS production data is broken down by manufacturer, vehicle type, and technology type. By pairing the IHS production data with EU testing emissions data from 2010–19 on the same types of vehicles globally for each manufacturer, InfluenceMap has been able to create a simplified estimate of future tailpipe emissions from 2020–29.

As the EU has some of the most efficient vehicles globally (alongside some of the strictest vehicle regulations), the emissions values from InfluenceMap’s model likely underestimate real-world emissions of vehicles sold outside the EU. The model includes a simplified real-world emissions estimate, based on research from the International Council on Clean Transportation (ICCT) which found significant gaps between global testing regimes and real-world emissions from the automotive sector.
The ICCT found a CO2 gap of up to 40% between the EU’s New European Driving Cycle (NEDC) procedure and real-world driving condition emissions, which has been incorporated into the model through the estimated real-world emissions line (see below). More information on InfluenceMap’s emissions model can be found on the emission model methodology page.

The ‘Vehicle Efficiency’ graph provides a simplified model of automakers’ current and future emissions, calculated by combining EU vehicle emissions data with forecasted light-duty vehicle production data from IHS Markit. The three lines represent the estimated lab emissions (modeled on EU testing data) and the estimated real-world emissions testing gap (based on ICCT research), alongside the IEA’s Sustainable Development Scenario (SDS) which limits warming to 2°C (a 1.5°C pathway is not yet publicly available).

The model strongly suggests that the global investments in zero-emission vehicles from the automotive industry automotive are not keeping pace with a Paris-aligned transition, with emissions set to be significantly higher than the IEA’s 2°C Sustainable Development Scenario overall. Some of the key reasons for this are outlined below:

- Increased hybrid vehicle sales and further combustion engine efficiency are not enough to decarbonize the sector. The IPCC’s April 2022 Working Group III report noted that “electric vehicles powered by low emissions electricity offer the largest decarbonization potential for land-based transport, on a life cycle basis (high confidence)” whereas “ICEV, HEV, and PHEV technologies, which are powered using combustion engines, have limited potential for deep reduction of GHG emissions”. However, this analysis finds that many global automakers are strategically focused on producing ICE-powered hybrid and plug-in hybrid vehicles in the long term with limited potential for significant GHG emissions reductions compared to rapidly increasing battery electric vehicle production. This strongly suggests that automakers are not transitioning fast enough to battery electric vehicles to decarbonize global road transport in line with the Paris Agreement.
Growing SUV sales threaten automotive sector decarbonization. According to the IEA, the increased size and weight of vehicles have become a major driver of emissions, with SUVs alone constituting the second-largest cause of global increases in carbon dioxide emissions between 2010 and 2018. The IPCC's Working Group III report also highlighted that the trend towards higher vehicle size and engine power “may result in higher overall emissions” from light-duty vehicles “relative to smaller vehicles with the same powertrain technology”. InfluenceMap analysis of IHS Markit data finds that the forecasted global production of SUVs will increase from 39% of all light-duty vehicles in 2020 to 47% of all vehicles by 2029 (see graph above), with every automaker analyzed forecast to produce a higher proportion of SUVs in its global fleet by 2029 than in 2020. Rising SUV sales (and light truck/commercial vehicle sales in the US) will likely cancel out many of the emissions reductions from increased battery-electric vehicles, with larger and heavier vehicles generally requiring more energy to both manufacture and operate. This trend is driven by automakers increasingly selling larger vehicles partly because their per-unit profits are highest from sales of SUVs and pickup trucks.
Appendices

Appendix 1: Climate Policy Engagement Scores and 2029 ZEV Projections

(Dataset from InfluenceMap's LobbyMap database, and IHS Markit's March 2022 Light Vehicle Forecast, first available in April 2022)

<table>
<thead>
<tr>
<th>Company &amp; Link to Automotive Climate Tool Profile</th>
<th>Performance Band</th>
<th>Organization Score</th>
<th>Relationship Score</th>
<th>Engagement Intensity</th>
<th>Forecast zero-emission vehicle production in 2029 as % of global fleet</th>
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<td>Next Year</td>
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<tr>
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<td>48%</td>
<td>32%</td>
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## Appendix 2: Automakers’ Industry Association Memberships and their Climate Policy Engagement Scores

<table>
<thead>
<tr>
<th>Industry Association and Link to LobbyMap Profile</th>
<th>Alliance for Automotive Innovation</th>
<th>European Automobile Manufacturers Association (ACEA)</th>
<th>German Association of the Automotive Industry (VDA)</th>
<th>Japan Automobile Manufacturers Association (JAMA)</th>
<th>Society of Motor Manufacturers and Traders (SMMT)</th>
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<td>E+</td>
<td>D-</td>
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<td>☑</td>
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</tr>
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<tr>
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<td>❌</td>
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<tr>
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<tr>
<td>Volkswagen Group</td>
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<td>❌</td>
<td></td>
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</tr>
</tbody>
</table>

**KEY**

✔ Member of industry association

❌ Not a member of industry association