26th July 2024

California Air Resources Board
1001 I Street,
Sacramento, CA 95814
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Subject: Comments to Advanced Clean Cars II Amendments – June 2024 Workshop

Jaguar Land Rover (JLR) welcomes the opportunity to comment on the Advanced Clean Cars II (ACC II) Amendments - June Workshop. JLR thanks the California Air Resources Board (CARB) for their efforts to inform stakeholders of potential amendments to the regulation.

JLR is a UK-based niche manufacturer of specialist premium passenger cars and luxury sport-utility vehicles. In the USA, through our 211 franchised retail outlets, 52 located in California, Jaguar Land Rover North America, LLC (JLRNA) sells vehicles from our class-leading, modern luxury Range Rover, Discovery, Defender, and Jaguar brands. In 2023MY, our sales of just over 17,000 units accounted for under 1% of new motor vehicles registered in California.

Our Reimagine strategy was published in February 2021[1]. This is where we communicated the ambitious, electric future of our fleet. Beginning with our iconic Range Rover brand, the new all-electric model will be available for pre-order in 2024. Central to Reimagine is the transition to an electric future for all brands, with plugin electric hybrids acting as a key stepping stone. Before the end of the decade Range Rover, Discovery and Defender collections will all offer pure-electric options, while Jaguar will be entirely electric.

JLR strongly supports efforts to reduce greenhouse gas (GHG) emissions for passenger cars and light trucks, alongside improving fuel economy and advancing the transition to zero emission vehicles (ZEVs[2]). We are investing £15 billion over the next five years to support an electrified future, details of which can be found in the Appendix.

We support the Alliance for Automotive Innovation (Auto Innovators) comments. In this submission, we comment specifically on the challenges that JLR could face under the potential amendments to the GHG standards. To support the transition to a zero-emission future, JLR would welcome CARB's consideration of the following comments.

GHG Target Stringency Must Not Jeopardize EV Transition

JLR opposes the introduction of GHG fleet targets post 2025MY. JLR strongly disagrees with the need to develop new GHG standards beyond this point while the comprehensive ZEV mandate regulation is in place. As CARB stated in the June workshop, "With ZEV regulation, California fleet will likely outperform EPA's standards." Therefore, as we mentioned in our previous response to the November workshop, JLR encourages CARB to re-evaluate whether additional GHG standards beyond 2025MY are required. We believe that the GHG reductions achieved through the ACC II ZEV Mandate will be more than sufficient to meet CARB's goals.

[1] *Year refers to calendar year unless otherwise specified.*
[2] *Zero emission vehicles (ZEVs) refer to battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs).*

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JLR does not support the introduction of ICE-only targets in 2030MY that mandate the improvement of ICE GHG emissions. If plans go ahead to set a new ICE-only standard, JLR urges CARB to be cautious when setting target stringency to avoid causing OEMs to divert investment away from the BEV transition when it is needed most. There is a significant difference between setting a flat standard to ensure that ICE vehicle emissions do not backslide from today's achievements and mandating year-on-year improvements to ICE vehicles.

We support the proposal to keep the current 2025MY target coefficients through 2029MY. The proposed implementation date of the new standard in 2030MY is appreciated from a lead time perspective; however, it is not financially feasible for a company to invest in ICE technologies now for vehicles that will be produced in 2030MY and can only be sold in the market for a maximum of 5 years.

The ZEV mandate regulation forces ICE volumes to reduce each year, as Figure 1 illustrates below. As a smaller volume manufacturer, our ICE volumes will be extremely low comparative to industry. Therefore, it is a much higher risk investment for JLR to invest in engine redesigns when there will be very limited opportunity to regain that investment.

If these standards are finalized, JLR may have to make the decision to re-prioritize planned investments for BEVs into our ICE fleet, which could have a knock-on impact to the rest of our product strategy, negatively impacting our roll-out of new electric vehicles and delaying the transition.

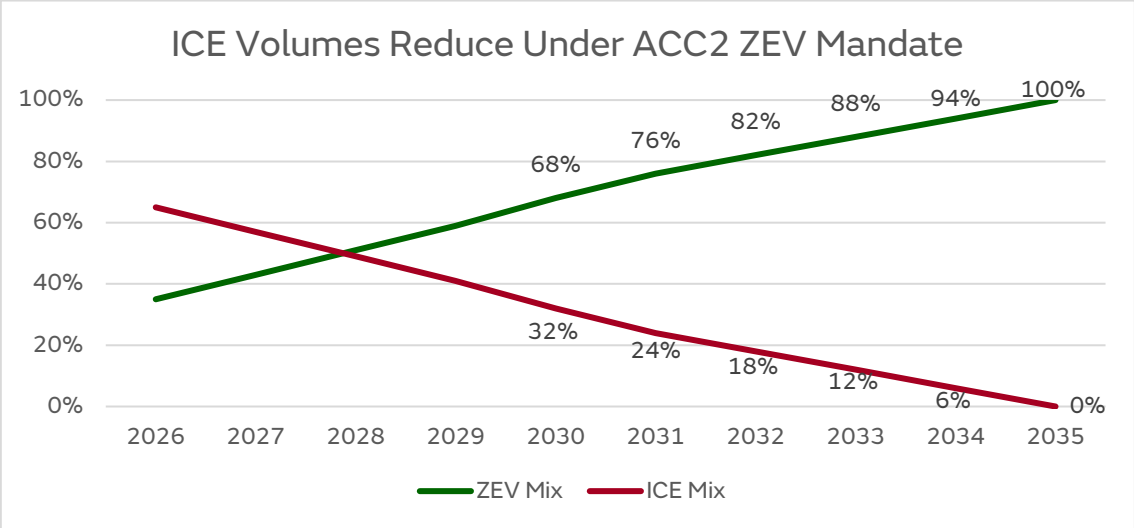

Figure 1

Figure 2 takes an example scenario where if a manufacturer were to sell the maximum number of ICE vehicles allowed under the ZEV mandate, even with no improvement to the CO_2 emissions for the vehicles, the absolute emissions would still decrease by 81% across 2030-2034MY. Absolute emissions consider the total GHG emitted in tons of CO_2, calculated by multiplying the fleet average CO_2 value by the volume of vehicles sold, in this case, the remaining ICE fleet volume. This will diminish over time, in line with the ZEV mandate targets. This demonstrates that ICE improvements are not needed alongside a reduction in ICE volume to lead to an overall reduction in greenhouse gas emissions.

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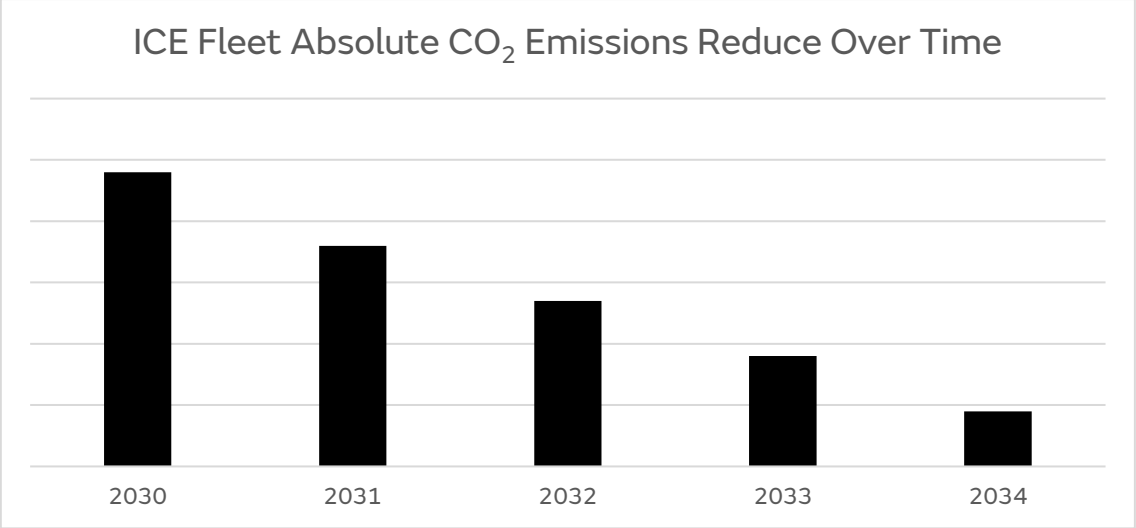

Figure 2

JLR believes that setting an ICE-only fleet target would drive additional complexity into the regulation. Regardless of whether a flat or sloped target with year-on-year stringency is set, an appropriate reference year must be chosen. Considering the ICE and PHEV portion of the fleet specifically means that the current target levels and coefficients cannot be used in the setting of a baseline.

If a new standard must be set, JLR suggests that the stringency level should be set as a flat target at an OEM's ICE & PHEV CO_2 performance in a past baseline year. Choosing to set a CO_2 backstop based on a generated footprint-based target penalizes those OEMs whose performance does not meet the target and would likely force them into a non-compliant state from the initial year**.**

Requiring manufacturers to invest in year-on-year improvements to a powertrain that will be banned in 2035MY is economically unfeasible. CARB must acknowledge that if they were to finalize ICE-only targets with increasing levels of stringency this could result in a significant level of non-compliance across industry, leading to fines or credit purchases which diverts funds from improving the electric vehicle offering. This is unacceptable, and diverting significant cost from electrifying the fleet further will cause a reduction in benefits to both consumers and the environment.

We have additional concerns about the complexities involved in setting a reference year GHG target for the ICE and PHEV-only fleet, including the question of which year would be chosen to base new targets upon. JLR would welcome the opportunity to continue its constructive dialogue with CARB to discuss this further.

The proposal for ACC I GHG credits earned between 2026-2029MY to expire after 2029MY unless below the EPA federal standard will be burdensome to both OEMs and CARB. It will require additional resource to calculate the number of credits that will be allowed to be carried forwards. The potential for future amendments to the federal targets should also be considered, any changes to this could disrupt manufacturers' forecast and planning for future compliance.

PHEVs Should Maintain an Advantage in the GHG Regulation Compared to ICE

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Whilst we appreciate the intent behind the proposal to regulate only PHEV charge-sustain emissions, we do not believe this is an appropriate route forward, as it does not give PHEVs their due value in a scenario where ICE and PHEV are regulated under the same target between 2030-2034MY.

[REDACTED][CBI] This is not a true reflection of reality, as the data presented by CARB from the Bureau of Automotive Repair demonstrated that PHEVs do emit less CO_2 than ICE. Whilst we understand this same dataset implied there should be a discussion on an appropriate PHEV CO_2, it still demonstrated that PHEVs do still emit less CO_2 than ICE and that real-world PHEV CO_2 is lower than its equivalent ICE CO_2 and HEV CO_2. To only consider charge-sustain emissions eliminates this true advantage of PHEVs. The fact that PHEV CO_2 is lower than ICE and HEV needs to be maintained in the greenhouse gas regulation, and this is not maintained if only charge-sustain emissions for PHEVs are considered.

If a greenhouse gas target is to be set on both the ICE and PHEV portion of the fleet, there must be a benefit remaining in the greenhouse gas regulation to selling PHEVs, regardless of what level the fleet target is set at.

Furthermore, we believe that the real-world emissions of PHEVs will improve. The ZEV mandate requirement for PHEVs places a range of 70 miles – as these PHEVs reach scale and as charging infrastructure improves, the real-world emissions should demonstrate an improvement. As such, we believe a decision to change to charge-sustain emissions from 2030MY is too soon and too drastic to take place today.

Additionally, this proposal to bring more focus to PHEV charge-sustain emissions means car makers are diverted away from investment in the ZEV capabilities of PHEV, which is instead diverted towards the ICE portion. We believe that the focus should remain on enhancing and extending the useful electric range and zero-emission driving capabilities of PHEVs to drive consumer interest into electric vehicles and reduce overall greenhouse gas emissions.

With regards to a PHEV-specific target from 2035MY, we believe it is too early to have that discussion today. We do not know what type of PHEV will still be on sale in 2035MY and how the market will develop – both in terms of the type of vehicle (REEVs {range extender electric vehicles} vs PHEVs), vehicle attributes and even to what extend PHEVs will still exist in the market in terms of their sales volume. Once the regulation is agreed out to 2034MY, the conversation should take place on what could exist in the 2035MY+ regulation.

<u>Increasing ICE Emissions Does Not Mean Individual Vehicle Performance Has Degraded</u>

For several years, CO_2 regulations have been in the form of performance-based standards, which allows manufacturers to choose which technologies to deploy within their fleet to achieve compliance, whether that be investing in new technologies to reduce emissions in traditional ICE vehicles, bringing new zero-emission vehicles to market or a combination of both. To isolate one portion of the fleet with the aim to set specific standards changes this fundamental principle of the regulation – that car makers have the choice to reduce fleet emissions by investing in ICE or by investing in zero-emission vehicles without being penalized for which route they take.

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If we consider the diminishing ICE fleet in isolation, there are multiple factors that could affect a manufacturer's fleet and give the impression that ICE emissions are increasing. These include changes to vehicle footprints, product types, model mix within the fleet and transitioning ICE nameplates to BEV. This does not mean that there has been a degradation in the performance of the vehicles.

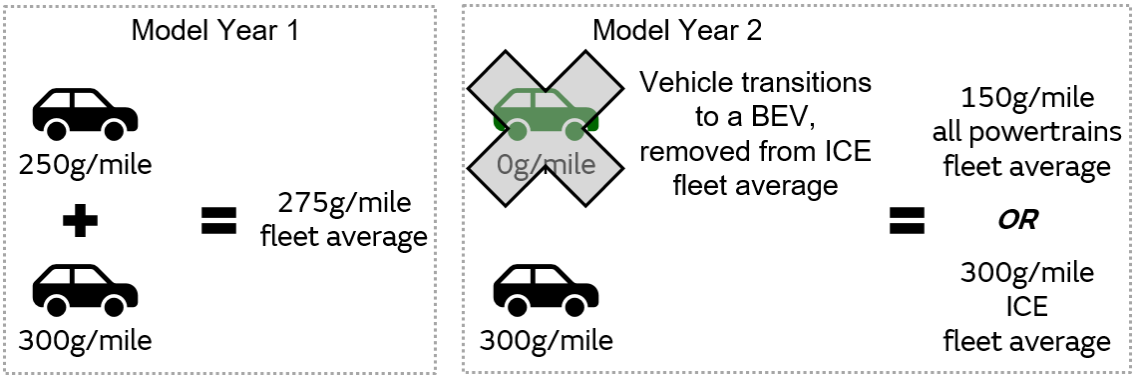

Figure 3

Figure 3 illustrates an example where a manufacturer has a fleet of two vehicles of equal volume, in the first model year the ICE-only fleet average is 275g/mile however in the second model year this increases to 300g/mile as the lower CO_2 ICE nameplate transitions to BEV. Although this may look like the overall fleet average has increased by 25g/mile, if we consider the entire fleet with BEVs included, the fleet average has decreased by 125g/mile to 150g/mile. In this example, if using the ICE-only measure proposed by CARB, a car maker is penalized for their electrification plans. **We do not believe this should be a possible consequence of the proposal to regulate only ICE emissions.**

Additionally, if we consider the absolute emissions in tons of CO_2 from the ICE vehicles alone, shown in Figure 4 below, it reduces by 45% between Model Year 1 and Model Year 2.

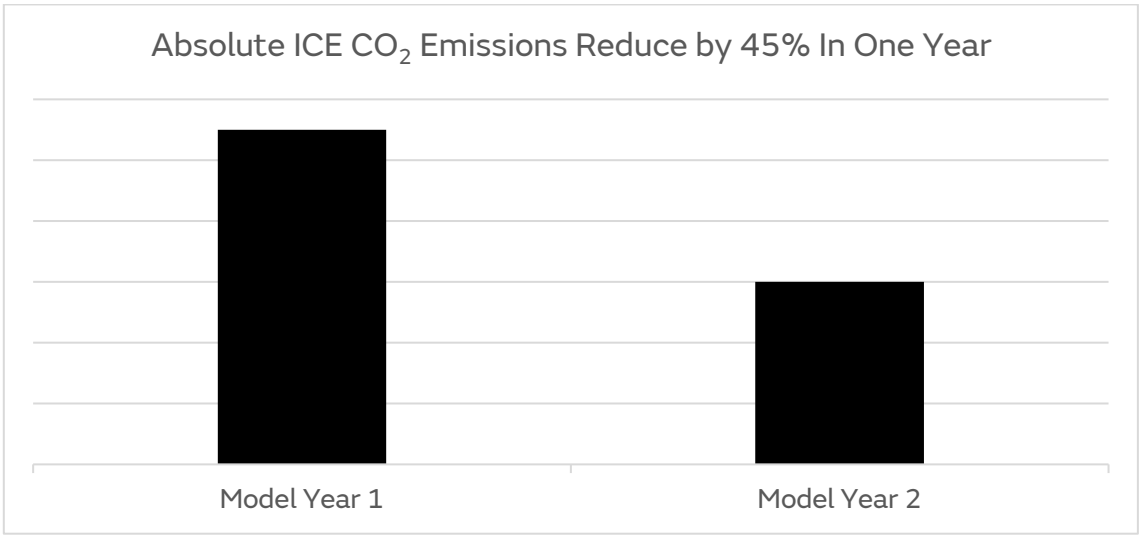

Figure 4

Manufacturers aim to produce a vehicle fleet that complies with all four CO_2 emissions standards with aims to improve vehicle efficiency, reduce emissions and increase the uptake

of low and zero emission vehicles. (Federal CAFE & GHG, alongside California & Section 177 states ZEV and GHG). CARB's ZEV mandate will act as a driver to increase EV adoption and reduce fleet emissions. As a result of this ICE vehicle volumes will drastically reduce over time, and therefore the emissions from ICE vehicles in tons of CO_2 will continue to decrease. We urge caution in the discussion on setting ICE-only targets, such that car makers who are prioritizing EV adoption and investment are not unintentionally penalized for doing so.

Flexibilities Should Be Considered Given the Scale of Change CARB Is Proposing

Given the scale of change CARB is proposing from 2030MY in moving to an ICE-only greenhouse gas regulation, and then again in 2035MY, such a change must be accompanied with sufficient flexibilities in the regulation to support the transition to the new standards for all manufacturers.

These flexibilities are especially important to manufacturers such as JLR, that will have limited ICEV models remaining. Under the previous ZEV mandate, JLR qualified as an Intermediate Volume Manufacturer, which was representative of the fact that we are nowhere near the size of other manufacturers, in terms of sales volume, R&D budget and product lines – in both a global and local sense. We encourage the reintroduction of this IVM classification.

[REDACTED][CBI] We have very little flexibility to maneuver our fleet to meet different regulations globally, unlike larger car makers.

As such, we believe that additional flexibilities from 2030MY should be considered for both industry as a whole and manufacturers with limited ICEV models. However, we believe that it is too early to provide comprehensive detail on which flexibilities would be most valuable for industry, as this will depend on how the targets are set and how the fleet will be regulated.

We urge this topic be tabled for a future workshop & request CARB look at what different flexibilities exist in other global regulations:

- Where a target has been flatlined, the phase-in flexibility should be reviewed.
    - In China, the target is phased in across a 5-year period. For example, if the industry fuel consumption target is 3.3l/100km, the phase in requires that 130% of the target is achieved in 2026 (4.29l/100km), 124% in 2027 (4.09l/100km) and so forth until the requirement reaches 100% of the target in 2030.
    - In the EU, the fleet status itself was subject to a phase-in, whereby the 95% best-performing portion of the fleet alone counted towards a car maker's compliance status. This was in effect for one year only, with 100% of the fleet required to meet the target from year two onwards.
- Give car makers with limited ICEV models a time lag before which the targets set are applicable to them. This could be similar to the provisions EPA allows for Small Volume Manufacturers (SVM). In the latest GHG final rule, SVMs have a delayed schedule to meet the primary program standards, with additional lead time as compared to larger volume manufacturers. For example, the 2025MY standards are required to be met in 2027MY, providing an additional two years of lead time.

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For car makers with limited ICEV models, it may be possible to allow them the opportunity to comply with the regulation if they can prove no degradation in the CO_2 of a specific ICE derivative. This is more complicated for larger car makers with many programs, but for a car maker the size of JLR, **[REDACTED]**[CBI] For JLR to prove no degradation in the individual derivatives should be enough to prove compliance against a greenhouse gas target.

Transferring Excess ZEV Credits

Regarding the specific proposal to allow the transfer of excess ZEV credit values into greenhouse gas credits, we do not view this as a flexibility that will provide relief to car manufacturers. The ZEV mandate targets are stringent enough that there is unlikely to be much headroom remaining to transfer into greenhouse gas credits.

We also view the requirement for such a flexibility as indicative that the greenhouse gas regulation has not been set appropriately. If the ACC II GHG amendments are designed such that the target is set appropriately and that there are sufficient flexibilities available for the manufacturer to achieve compliance on its own, there should be no reliance on overcompliance in the ZEV portion of the regulation.

Continuation of Credit Banking and Trading Provisions

We believe flexibilities are a fundamental part of any regulation. They allow for car manufacturers' different plans and launch cadences, allowing each manufacturer to develop their own path for compliance.

JLR fully supports CARB's proposal to make no changes to credit banking and trading provisions through 2029MY. We commend the agency for the continued inclusion of the flexibility to carry backwards and forwards the overcompliance in a given calendar year to offset any shortfalls in another year.

For credit banking from 2030MY, JLR opposes the proposal for credit carry forward to be limited to only those credits below the EPA standard. JLR suggests a cap or a mechanism similar to the ZEV ACC I to ACC II conversion of credit balances.

As a lower volume manufacturer, JLR relies on these flexibilities due to our limited product line up with typically less than half the opportunities to introduce new models and technologies to the market compared to larger manufacturers.

Pooling Provisions for California and Section 177 States

JLR supports the current flexibility of allowing credits to travel between California and all S177 states signed up to the LEV program. We request that this provision remains in place for any future regulations.

It is particularly challenging as a smaller manufacturer to meet the compliance targets in each individual state in part, due to the reduced resources available to us. The pooling flexibility is a key driver in ensuring that we can achieve compliance across the whole of California and S177 states.

Conclusion

JLR supports the aims of the agency to further grow the ZEV market, reduce GHG emissions, and achieve carbon neutrality by 2045.

We appreciate your consideration of the following.

- JLR opposes the introduction of GHG fleet targets post 2025MY. GHG reductions achieved through the ACC II ZEV Mandate will be more than sufficient to meet CARB's goals.

- JLR does not support the introduction of ICE-only targets in 2030MY that mandate the improvement of ICE GHG emissions.

- ICE-only fleet average targets drive further complexity into the regulation. Absolute ICE emissions will decrease over time as the volume declines and the industry BEV mix increases. If a new standard must be set, JLR suggests that the stringency level should be set as a flat target at an OEM's ICE & PHEV CO_2 performance in a past baseline year.

- CARB must acknowledge that if they were to finalize ICE-only targets with increasing levels of stringency this could divert funds from the electric vehicle transition.

- If a greenhouse gas target is to be set on both the ICE and PHEV portion of the fleet, there must be a benefit remaining in the greenhouse gas regulation to selling PHEVs, regardless of what level the fleet target is set at.

- We support additional flexibilities in the regulation from 2030MY to ensure there is a path to compliance for all car makers. We encourage CARB to take inspiration from other global regulations.

JLR appreciates the opportunity to share our ideas on this critical subject. We look forward to continuing to work with CARB moving forward.

Thank you for your consideration of our comments.

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Appendix

Further Information About JLR

Despite JLRNA's relatively small market share, we are proud of the outsized impact we have on the local US economy. Through our headquarters operation in Mahwah, New Jersey, our Digital Design Center in Portland, Oregon, our nationwide Parts Distribution Centers, port operations in California, Georgia, and Maryland plus our supplier retailer network, we are responsible for approximately 10,000 US jobs.

Our aims don't stop at our Reimagine strategy. Our sustainability goals, approved by the Science Based Targets initiative (SBTi), put us on a pathway to limit warming to 1.5°C in line with the Paris Agreement. We aim to be a net zero carbon business by 2039, with an ambition for global zero tailpipe emissions by 2036.

We are committed to this journey but know that we cannot drive it alone. Despite our size, we're investing £15 billion over five years in our industrial footprint, vehicle programs, autonomous, artificial intelligence (AI) and digital technologies and people skills to make it happen. Transforming the car market to a zero-emission future requires the right set of conditions - a combination of infrastructure improvements, consumer incentives, consumer readiness.

JLR is committed to reducing CO_2 emissions of our passenger cars and light trucks. JLR embarked on an extensive journey to reduce its fleet average CO_2, which was highlighted in the in the recently published 2023 EPA Automotive Trends Report.

"Compared to the first year of the program, Jaguar Land Rover leads manufacturers in the overall reduction of 2-cycle CO2 emissions (99 g/mi)[3]".

JLR has accomplished this by focusing on improving all aspects of its fleet CO_2 and fuel economy: improving the traditional internal combustion engine fleet, investing in electrification and low carbon technologies. Our 2023MY Range Rover model is fitted with a lightweight electronic air suspension system that aids efficiency and is responsible for up to 13 g/mile CO_2 reduction compared to a hydraulic system. Additionally, it features intelligent All-Wheel Drive (iAWD) which optimizes efficiency at speeds above 21mph and up to 100mph, reducing drag losses by 30% and contributing to a reduction in CO_2 emissions of up to 6.4 g/mile.

JLR has invested a significant amount of money in developing our cleanest and most efficient engines to date with our world-class Ingenium engines. This can be combined with the addition of our Mild Hybrid Electric Vehicle System, which is capable of harvesting energy on the move, further improving vehicle efficiency.

The biggest improvements in our fleet will be seen in the years to come through our transition to electrification. JLR will harness strategic partnerships to facilitate our ambitious journey. Our partnership with US-based Wolfspeed, Inc. ensures the supply of Silicon Carbide semiconductors for the inverters in our next generation electric vehicles, delivering increased powertrain efficiency and extended driving range through managing the transfer of power

[3] EPA Trends Report 2023- https://www.epa.gov/system/files/documents/2023-12/420r23033.pdf

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from the battery to the electric motors. The first Range Rover vehicles with this advanced technology will be available from 2024, and the new all-electric Jaguar brand the following year.

It is through our continued participation in the all-electric Formula E World Championship where we can design, collaborate, test, and develop new sustainable technologies at pace. The partnership with Wolfspeed builds on this – their advanced Silicon Carbide technology has been used to accelerate on-track efficiency and performance with the race-winning Jaguar TCS Racing team competing in the Formula E World Championship.

Another key strategic partnership is with NVIDIA, the leader in AI and computing, to jointly develop and deliver next-generation automated driving systems plus AI-enabled services and experiences for its customers. Starting in 2025, all new Jaguar and Land Rover vehicles will be built on the NVIDIA DRIVE™ software-defined platform—delivering a wide spectrum of active safety, automated driving, and parking systems as well as driver assistance systems.