Pagani Comment for Drive Forward Light-duty Vehicle Program Workshop June 2026

Pagani appreciates CARB's efforts to engage stakeholders early in the development of future light-duty vehicle standards. Pagani also recognizes California's important air quality and climate objectives. At the same time, Pagani urges CARB to account for the unique circumstances of low-volume manufacturers when developing future criteria pollutant, greenhouse gas, particulate matter, ZEV, non-exhaust, evaporative, and fuel-related requirements.

Pagani is an very low volume manufacturer of specialized high-performance vehicles. See www.pagani.com

We are a niche Italian corporation formed in 1991 and owned by the Pagani family. It is a privately held, independent, small volume vehicle manufacturer under CARB regulations (**SVM**) and has no ownership relationship with other manufacturers. Pagani also meets the definition of "Small Business" according to the federal Small Business Administration regulations in 13 CFR part 121.

The current Pagani model is the Utopia, Utopia | Pagani , an extremely high-performance supercar with state-of-the-art automotive design and engineering. Pagani has very limited production, with a worlwide annual production fewer than 100 vehicles.

When Developing the "Drive Forward Light-Duty Vehicle Program" Pagani Urges CARB to Consider that the Real World Environmental Impact of SVMs is de minimis

SVMs represent a tiny fraction of the US automobile market. The fraction is so small that the companies have a minuscule impact on US air pollution.

The vehicles of SVMs are typically not "daily drivers" but rather "occasional use" cars. SVMs usually produce limited-production, high-performance, collector, lightweight sports cars. As a result, the average annual miles driven by these vehicles is drastically less than-- perhaps 25% of -- the average annual milage of an everyday passenger car (typical low mileage of 2,543 miles per year [1]). Fewer miles driven is one way to reduce vehicular pollution.

More specifically related to our company, a customer survey shows even a lower annual mileage – *less than 1000 miles/year.*

In short, low volume OEMs have a *de minimis* effect on emissions. However, the technical and financial burden of new emission-control requirements can be disproportionately severe for these companies-because those costs must be absorbed over a very small number of vehicles.

Pagani certifies only one test group for the U.S. market, with limited test-vehicle availability and no ability to spread engineering, calibration, testing, certification, and compliance costs across a broad product portfolio. These facts are important because many of the preliminary ideas discussed during the workshop are designed around high-volume manufacturers with multiple platforms, larger fleets, and the ability to average emissions performance across a broad product mix.

[1] *Exemptions from Average Fuel Economy Standards; Passenger Automobile Average Fuel Economy Standards*, *National Highway Traffic Safety Administration, RIN 2127-AM29*

Pagani Requests that CARB Provide Appropriate *Very* Low-Volume Manufacturer Flexibility in the Drive Foward Prgram

CARB's workshop materials identify several major issues under consideration, including low-emission vehicle standards, ZEV0 bin certification, greenhouse gas standards, and the ZEV regulation.

In the past, CARB has used the "ultra-small volume manufacturer "(**USVM**) category to implement fair and reasonable requirements for very low volume OEMs. For example, see **Cal. Code Regs. Tit. 13, § 1976 - Standards and Test Procedures for Motor Vehicle Fuel Evaporative Emissions | State Regulations | US Law | LII / Legal Information Institute**. In this section, in order to provide extra flexibility to very small OEMs, CARB created specific USVM provisions and defined "ultra-small volume manufacturer" as "a manufacturer with California sales not exceeding **300** vehicles per MY, based on the average number of vehicles sold by the manufacturer in the previous three consecutive MYs."
This approach would be entirely appropriate as regards Drive Forward, as dicussed below given the stringency of what is being discussed.

Pagani urges that USVM flexibility is needed as follows:

1. **Bin ULEV125**

Pagani is deeply concerned that eliminating bin ULEV125 would remove the only certification pathway for some low volume manufacturers such as Pagani.

The elimination of ULEV125 would be both unfair and unreasonable as regards USVMs -- because it would put those mnaufacturers in the untenable position of having to, with limited resources, drastically reengineer ULEV125 vehicles and most likely chnage the very nature of their product..

*Accordingly, Pagani requests that CARB establish a new bin, "**ULEV125-USVM**" for use only by USVMs*. Creating a bin only for USVMS would not undermine CARB's broader fleetwide objectives, given the extremely small number of vehicles involved and how USVMs would still need to meet the fleet avarege. But it would preserve a feasible certification pathway for niche manufacturers having very limited production volumes and very limited product-line flexibility, such as Pagani. This request is consistent with current 13 CCR 1961.4, which allows SVMs extended use of Bin ULEV125. Section 1961.4 provides as follows: "For manufacturers other than small volume manufacturers, the ULEV125 category is only applicable for the 2026 through 2028 model years. For small volume manufacturers, this category is applicable for the 2026 through 2034 model years."

2. **NMOG+NOx Fleet average**

CARB's workshop materials describe a light-duty NMOG+NOx fleet-average proposal that drops the standard to 12 mg/mi in MY2038.

It would be unfair to USVMs to set a fleet standard so stringent that it forces these companies not only to rely on credits from other manufacturers in order to achieve compliance but also to purchase a large number of such credits when considered *on a per car basis*. It is especially unfair given USVMs' negligible contribution to air pollution. That is, there would be a huge burden on these companies without a commensurate benefit to the environment.

For a large manufacturer, a lower fleet-average standard may be addressed through a portfolio-wide strategy involving multiple ICE platforms, hybrid vehicles, PHEVs, BEVs, and credit mechanisms. For For USVMs like Pagani, the situation is fundamentally different. Pagani has only one test group, and a California fleet that does not allow averaging emissions performance.

A USVM's fleet compliance cannot be put at the mercy of other manufacturers selling credits. The decision to sell credits, to whom to sell them, at what price to sell them, and when to sell them (or to keep them for later use or future value) is a business decision. There is nothing that requires a manufacturer to sell its credits, or to sell them to a particular party.

In addition, to the extent the Drive Forward Light-Duty Vehicle Program compliance is based on an assumption of a high level of fleet electrification, if this premise turns out to be flawed, and sales of electric vehicles are not as high as expected, many manufacturers will likely need to hold onto their credits to maintain their own compliance, and USVMs will see their credit purchasing compliance option disappear.

The solution to this dilemma is to create a separate fleet average for USVMs.

3. **PM 0.5 mg/mi standard**

CARB's workshop materials include a proposal to establish a particulate-matter standard of 0.5 mg/mi for vehicles under 14,000 pounds GVWR beginning in model year 2031, applicable over the FTP, Cold FTP at 20°F (−7°C), and US06 test cycles. [2]

Pagani supports continued reductions in particulate-matter emissions but is concerned that applying a 0.5 mg/mi standard over multiple test cycles, without a low volume compliance pathway. The absence of such a pathway would impose disproportionate feasibility, lead-time and certification burdens on USVMs.

Pagani certifies a very limited product range within a single test group. A single high PM test result caused by cold-start operation, high-load transient operation, laboratory variability or low-level measurement uncertainty could prevent certification of Pagani's entire California product line.

Furthermore, there are also technical issues and costs associated with measuring PM emissions below 1 mg/mile, and specialized, expensive test facilities may be needed to reliably measure PM at such a low level.

Pagani requests that CARB establish a specific PM compliance pathway for USVMs. CARB should adopt an USVM PM standard as follows:

- ✓ FTP → 1 mg/mi.
- ✓ US06 → 3 mg/mi.
- ✓ Cold Test → No limit

(colf PM testing is not appropriate given the typical usage of niche vehicles).

[2] We realize that EPA has a 0.5mg PM requirement as part of upcoming Tier 4. However, EPA has clearly indicated that it is reconsidering Tier 4 requirements, and SVMs and USVMs intend to present the 0.5mg PM infeasibility argument to EPA. See Federal Register : Revision of Tier 4 Criteria Pollutant Standards, Part 1: Amendments to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles

These provisions would preserve CARB's emission-reduction objectives while avoiding a result whereby a standard is so stringent that it effectively excludes niche specialty vehicles, such as Pagani's, from the California market despite their minute aggregate emissions contribution.

4. **Bin ZEV0 and ZEV Regulation**

CARB's workshop materials propose implementing a Bin ZEV0, intended to add flexibility for meeting the fleet-average NMOG+NOx standard. The proposed Bin ZEV0 sets forth numerous criteria, including a minimum 200-mile two-cycle range requirement, durability, warranty, labeling, charging, and data standardization requirements.

We wish to emphasize that CARB should not assume that USVM specialty manufacturers can rely on Bin ZEV0 certification as a practical compliance pathway in the same manner as high-volume manufacturers. Certain ZEV0 requirements pertaining to range, battery durability, state-of-health reporting, propulsion-related warranties, charging standardization, data standardization, and service-information access would not be feasible for USVMs, who have limited resources, limited purchasing power, and limited electric-vehicle production experience.

Because most USVMs, like Pagani, have only one test group, they cannot use "averaging" as a compliance strategy. This means that a USVM must trasform their entire fleet into ZEV to achieve a minimum ZEV fleet compliance.

Pagani requests that CARB create a specific <u>USVM</u> ZEV0 Bin pathway that is optional and not detrimental for these companies.

5. **E15 Fuel requirements**

At the workshop CARB pointed out that E15 fuel was recently approved for sale in California, and that CARB is considering i) requiring vehicles to comply with emissions standards when operating on E15, ii) having an attestation option to reduce testing burden, and iii) potentially requiring CARB confirmatory or enforcement testing on E15.

Pagani greatly appreciates CARB's recognition that an attestation option should be available to reduce testing burden. For USVMs, adding E15 testing requirements on top of existing required testing would impose an unreasonable certification burden on these companies. The concern is not merely procurement of another test fuel. E15 requirements will affect exhaust emissions, PM testing, evaporative/refueling evaluations, OBD demonstrations, AECD review, calibration validation, fuel-system material compatibility, and fuel-economy/GHG confirmation.

Pagani requests that CARB allow USVMs to rely on attestation, engineering analysis, fuel-system compatibility information, carryover data, and limited confirmatory testing in lieu of full testing on multiple fuels. Any E15 compliance requirement should be structured to avoid multiplying the number of tests required for a USVM test group.

6. **Brake-Wear PM and Non-Exhaust Emissions**

Drive Forward materials also indicate that CARB is considering regulating non-exhaust emissions from brake wear and that the agency is evaluating test data, regenerative braking effects, test procedures, representative test cycles, and certification requirements. The materials identify UN GTR24 and the California Brake Dynamometer Cycle as potential procedures for measuring brake-wear PM emissions.

Pagani requests that CARB align any brake-wear PM requirements with international standards to the greatest extent possible, and particularly with the European and UN GTR framework. Global alignment is especially important for low volume manufacturers because duplicative testing would impose disproportionate cost and complexity. Requiring USVMs to perform separate California-specific brake-wear testing is neither necessary nor reasonable.

Pagani also requests that CARB provide USVMs with alternative compliance options, including supplier data, carryover brake-system data, engineering analysis, European/UN compliance data. Brake systems for low-volume specialty vehicles are sourced from specialized suppliers and may already be subject to extensive validation.

7. **Technology Assumptions for ICE Criteria Pollutant Reductions**

In its Drive Foward materials, CARB identifies technology advancements such as advanced turbocharging, gasoline direct injection, mild hybrids, Atkinson/Miller cycles, improved catalyst washcoats and substrates, optimized aftertreatment integration, and catalyzed gasoline particulate filters as available technologies for further criteria pollutant reductions from ICE vehicles.

While these technologies may be available in *some* segments of the auto industry, CARB should not assume that they can be applied uniformly or on the same timeline across all manufacturers and vehicle types. USVM specialty vehicles present unique packaging, thermal management, calibration, durability, OBD, and drivability constraints, not to mention the need to maintain the very nature of their product. Technologies that may be feasible for a high-volume vehicle platform may require so much extensive redesign, validation, and certification work when applied to a limited-production high-performance vehicle so that it is simply not doable from an economic viewpoint.

Pagani therefore requests that CARB evaluate technology advancement feasibility based not only on general availability, but also on manufacturer volume, platform architecture, product-cycle timing, certification burden, lead time and the nature of the product. If some technology advancements are not feasible for USVMs, they should not be consudered when detrmining the requiremsnts that USVMs must meet.

Conlcusions

In order to regulate USVMs in a fair, achievable and reasonable manner, the Drive Forward Light-Duty Vehicle Program must have USVM provisions of that are consistent with the principles of *feasibility*, *additional flexibilities* and *incremental* phase-in with *periods of stability.*

As explained above, numerous concepts discussed at the Drive Foward workshop are not feasible for USVMs.

Pagani therefore requests that CARB adopt specific USVM provisions as decsribed above.

In sum, Pagani requests that CARB create USVM requirements that are consistent with the goal of reducing air pollution while at the same time preserving the DNA of the USVM niche.

To this end, CARB should adopt the following USVM flexibilities to avoid imposing on USVMs an unreasonable economic burden caused by the staggering costs of new tecnology implementation:

1. Create a USVM certification Bin ULEV125-*USVM* to preserve a USVM certification pathway.
2. Create an NMOG+NOx fleet average standard that is specific to USVMs so that these companies are not forced to be overly-reliant on purchasing credits from other manufacturers.
3. Create USVM-specific PM limits of 1 mg/mi for FTP and 3 mg/mi for US06, without a limit for Cold Testing.
4. Create a specific USVM ZEV0 Bin pathway.
5. Provide attestation-based E15 compliance options for USVMs.
6. Align brake-wear PM requirements with UN/EU procedures; avoid duplicative California-only testing where federal, European, or supplier data are available.
7. Allow engineering analysis and use of supplier data where full testing is excesively burdensome for USVMs.
8. Preserve carryover data provisions for exhaust, evaporative, GHG, OBD, PM, and brake systems.
9. Provide extended phase-in timing for USVMs.
10. Provide a mechanism for case-by-case hardship relief for USVMs

We appreciate CARB's consideration of these comments and look forward to continued engagement as the Drive Forward Light-duty Vehicle Program develops.

Done at: San Cesario sul Panaro (Modena) - Italia
On: 07/16/2026

Federico Righi
Certification Manager