Why Euro 6e-bis brings another pre-production challenge for OEMs

By **Simon Williams CEng MIMechE, regulatory expert, MAHLE Powertrain**

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The UK's adoption of Euro 6e-bis emissions standards from April 2026 will represent a shift in how plug-in hybrid vehicles must be tested and validated during development. While original equipment manufacturers (OEMs) have been planning for this transition with increasing battery sizes for plug-in hybrid electric vehicles (PHEVs), the stagnating private purchases of electric vehicles (EVs) mean OEMs need to consider the increasing demand for PHEVs and focus on improving internal combustion engine (ICE) efficiency and increasing EV efficiency alongside larger batteries. Vehicles currently progressing through validation cycles may need complete recalibration to avoid catastrophic CO_2 rating increases.

At MAHLE Powertrain, we already work to EU standards while maintaining comprehensive UK certification capabilities. This gives us clear visibility into what's coming. We're seeing PHEVs that would achieve 10g/km CO_2 ratings under current UK protocols potentially jumping to 30g/km or higher under Euro 6e-bis utility factor calculations. This is a fundamental change that demands immediate attention from pre-production testing teams.

The challenge is particularly acute because the new standards don't just change the final compliance testing; they alter the calculation of the OEM fleet average CO_2, causing PHEVs to contribute more to this fleet average CO_2. This means OEMs have to sell more EV vehicles in a period of low consumer demand or improve the efficiency of the ICE and EV systems in PHEV and hybrid applications. OEMs continuing to develop PHEVs using current UK testing methodologies risk discovering compliance issues too late in the development cycle to implement cost-effective solutions.

Understanding utility factor calculations

The core of Euro 6e-bis lies in utility factor calculations, which alter how plug-in hybrid vehicles are assessed during type approval. Under current UK regulations, PHEVs undertake straightforward

charge-depleting and charge-sustaining test cycles that produce CO_2 figures that are not representative of all use cases. Euro 6e-bis introduces an updated calculation that biases the calculation toward the ICE operation of the vehicle, therefore placing increased relevance on ICE efficiency.

From our technology-agnostic testing experience, the utility factor methodology considers how frequently drivers actually charge their PHEVs, applying statistical weighting to different driving scenarios. This means that a PHEV designed and validated under current UK protocols could see its official CO_2 rating triple when subjected to Euro 6e-bis testing, even without any changes to the vehicle itself.

For pre-production testing teams, this focus on ICE and EV efficiency creates immediate challenges. At MAHLE, we're addressing this through our range extender (REx) and advanced battery systems technology, which allows us to optimize both electric range and charge-sustaining performance to meet the new requirements.

Validation timelines and fleet average impact

The transition to Euro 6e-bis creates significant challenges around OEM fleet average CO_2 compliance, particularly given consumer apathy toward private EV purchases. The issue for OEMs is the fast implementation of the UK regulation, which needs careful planning to ensure there are no fleet average CO_2 exceedances – a significant risk when considering what consumers currently want to purchase.

We're working with several OEMs to understand how the new testing protocols will affect their ability to meet fleet targets while satisfying market demand. The emphasis on improving ICE efficiency and implementing improved battery technology becomes critical when PHEVs contribute more heavily to fleet averages under the new calculation methods.

OEMs with PHEVs planned for launch in late 2026 or early 2027 face strategic decisions about powertrain development priorities. Euro 6e-bis requires different approaches to ICE optimization and battery system integration.

Progressive OEMs are implementing strategies that account for regulatory compliance and market realities; powertrain configurations that can achieve acceptable fleet average contributions while meeting consumer expectations for PHEV performance.

Changing PHEV development processes

Forward-thinking OEMs are implementing Euro 6e-bis validation throughout development processes, with MAHLE's ICE efficiency and REx/PHEV technology providing crucial capabilities for customers navigating this transition. Our range extender technology and advanced battery systems allow OEMs to achieve the balance between electric efficiency and ICE performance that Euro 6e-bis demands.

The process changes extend beyond testing protocols to encompass fundamental powertrain architecture decisions. PHEV concepts that work well under current UK regulations may be fundamentally unsuited to Euro 6e-bis requirements, making early validation crucial for avoiding costly late-stage changes.

We're seeing OEMs revisit their PHEV portfolio strategies in light of both Euro 6e-bis requirements and market demand patterns. Our REx and battery technology solutions help OEMs develop powertrains that can meet the new utility factor calculations while delivering the performance characteristics consumers expect.

For MAHLE Powertrain, our early adoption of Euro 6e-bis testing protocols positions us to support OEMs through this transition. Our dual UK-EU testing capabilities allow us to provide comparative analysis that helps OEMs understand the specific implications of EU6e and beyond, along with global regulations, for their vehicle programs.

To ensure that OEMs have the correct fleet mix to achieve customer requirements and type approval legislation requirements, Euro 6e-bis represents a current development reality that demands immediate attention. Since EU6e is already established in Europe, those adapting advanced ICE efficiency will navigate the transition successfully while meeting regulatory requirements and market demands.

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