

Terms of Reference

Electric Vehicles and the Environment Informal Working Group

(EVE IWG)

1. Procedural background

The previous mandate of the Electric Vehicles and the Environment (EVE) Informal Working Group (IWG) expired in January 2024. This updated Terms of Reference outlines the new mandate for the EVE IWG, which will aim to continue the development of previously published United Nations (UN) Global Technical Regulations (GTR), in phases, alongside the development of a new in-vehicle battery durability GTR for electrified heavy-duty vehicles and ongoing evaluation of other developments in relation to electric vehicle (EV) technology.

2. Introduction

While EVs are currently on the market and regulators are moving forward with setting applicable technical requirements, the technology is still evolving. This ongoing development necessitates a regulatory framework, that is performance-oriented and based on the best available data, scientific research and analysis.

Responding to the need for a comparable power rating between conventional vehicles and electrified hybrid vehicles, the EVE IWG published UN GTR No. 21 (*Determination of Electrified Vehicle Power*), in UN Global Registry on November 11, 2020. This regulation set out to establish a power rating for electrified vehicles that is qualitatively and quantitatively comparable with the traditional engine-based power ratings of conventional vehicles, through a reference method, largely informed by the Society of Automotive Engineers (SAE), the International Organization for Standardization (ISO), and the Korea Automobile Testing & Research Institute (KATRI).

In future phases of regulation development, possible considerations include the incorporation of a candidate method, which alleviates the need for dynamometer testing and makes use of component level results to determine the power rating at a lower cost. Other developments could include the consideration of fuel-cell electric vehicles, appropriate accuracy requirements, and alternative measurement methods for highly integrated systems.

Despite expected performance improvements in new EVs, the in-use performance of the battery through its useful life was not regulated. Recognizing excess degradation of the battery system over time may affect the environmental performance of EVs, the EVE IWG published UN GTR No. 22 (*In-Vehicle Battery Durability for Electrified Vehicles*), in the UN Global Registry on March 09, 2022.

Due to the focus of UN GTR No. 22 on light-duty vehicles and developments in the heavy-duty vehicle sector, the EVE IWG has been authorized to begin development of a new standalone UN GTR on in-

vehicle battery durability for electrified heavy-duty vehicles, at the 190th session of World Forum for Harmonization of Vehicle Regulations (WP.29).

As more vehicle performance and component level data becomes available, on-going research will be critical in continuing the development and refinement of UN GTRs. Therefore, the on-going assessment of developments in EV technology will be used to determine whether future policy may be necessary. In the event the EVE IWG identifies a need to develop new GTRs, following thorough review of the factors at play, a recommendation would be brought forward to the Working Party on Pollution and Energy (GRPE) and the Executive Committee of the 1998 Agreement (AC.3) for consideration.

3. Terms of reference

The IWG shall focus its work on the following activities:

3.1. Development of a new UN GTR on in-vehicle battery durability for electrified heavy-duty vehicles.

A. Phase 1

- i. *Initial draft development and working document submission to GRPE and AC.3 for consideration as a new UN GTR*
- ii. *Consider alternative test methods including chassis dynamometer testing.*

B. Phase 2

- i. *Continue development of alternative test methods including chassis dynamometer testing.*
- ii. *Consider the need for battery replacement provisions.*
- iii. *Explore the applicability of vehicle group O (trailers and semi-trailers) within the scope of the regulation*
- iv. *Future amendments as new data and continued research, analysis and testing lead to new developments.*

3.2. Amendment of UN GTR No.22 (*In-Vehicle Battery Durability for Electrified Vehicles*)

A. Phase 2

- i. Amend regulation to reflect applicability to light-duty vehicles.
- ii. Account for energy consumption not related to vehicle mobility, including an associated verification procedure.
- iii. Develop category-two vehicle minimum performance requirements.
- iv. Consider durability and warranty requirements from international jurisdiction policy.
- v. Refine performance criteria requirements through the assessment of further modelling and data collection of real vehicles.

B. Phase 3

- i. Incorporate necessary amendments based on lessons learned from the implementation experience of the contracting parties.

- ii. Consider the potential for motorcycle usable battery energy.
 - iii. Investigate minimum performance requirements for state of certified range.
 - iv. Consider Part C virtual distance test.
 - v. Future amendments as new data and continued research, analysis and testing lead to new developments.
- 3.3. Amendment of UN GTR No. 21 (*Determination of Electrified Vehicle Power*)
- A. Phase 2
 - i. Review and implement appropriate accuracy requirements.
 - ii. Develop a family concept.
 - iii. Consider system bench test alternative.
 - iv. Consider controller area network signals in place of direct measurement.
 - v. Consider measurement alternatives for highly integrated systems.
 - B. Phase 3
 - i. Consider the scope and application of system bench testing.
 - ii. Consider the need for power determination of electrified heavy-duty vehicles.
 - iii. Consider measurement alternatives for highly integrated systems.
 - iv. Consider a candidate method.
 - v. Consider fuel-cell electric vehicles.
 - vi. Future amendments as new data and continued research, analysis and testing lead to new developments.
- 3.4. Investigate electric vehicle charging power curves in conjunction with stakeholders of the WP.5 e-mobility task force and the activities of sub-cluster B3. Consider broader activities with WP.5 e-mobility task force and cluster D.
- 3.5. On-going review and analysis of relevant literature, policies and developing technologies (for example swappable batteries), including expert presentations, with the goal of identifying future work for the EVE IWG, with recommendation to GRPE and AC.3.
- 3.6. Investigation of the adoption and implementation of EVE IWG published UN GTRs, with the intention of considering regulatory amendments, based on lessons learned.
- 3.7. Review and coordination of considerations concerning EV environmental performance and associated technology, in the context of existing mandates of the other active IWGs, ensuring EVE IWG activities remain unique and complimentary.

4. Rules of procedures

The following elements form the procedural framework and shall be followed, wherever feasible. Concessions from the following rules will be left to the discretion of the IWG chair(s).

- 4.1. The EVE IWG is open to all participants of the GRPE. A limitation on the number of participants in the IWG, from any country or organization, is not foreseen.
- 4.2. The EVE IWG shall be governed by the co-chair(s), vice-chair(s) and technical secretary.
- 4.3. Chairmanship shall be the shared responsibility of representatives from the European Commission and the United States of America, for the period of January 2024 to June 2027.
- 4.4. Vice-chairmanship shall be the shared responsibility of representatives from China and Japan, for the period of January 2024 to June 2027.
- 4.5. The technical secretary shall be the responsibility of a representative from Canada, for the period of January 2024 to June 2027.
- 4.6. The official working language of the EVE IWG shall be English. Proceedings and documentation related to the IWG shall therefore be provided in English.
- 4.7. EVE IWG sessions shall be held in agreement with the majority of the participants, based on the joint proposal by the chair(s), vice-chair(s) and secretariat.
- 4.8. The agenda for the IWG session shall be circulated to all members of the IWG at least two weeks in advance of all scheduled sessions. The first item of the provisional agenda for each session shall be the review and adoption of the agenda. The second item of the provisional agenda shall be the review, discussion, and adoption of the formal report of the previous IWG session.
- 4.9. All documentation for any upcoming IWG sessions shall be submitted to the technical secretary, in a suitable electronic format, at least five working days in advance of the session. The IWG may refuse to discuss any item which has not been circulated five working days in advance. The technical secretary shall endeavor to post all session documents, at least, five working days prior to the IWG session.
- 4.10. The technical secretary shall endeavour to circulate, at least five working days in advance of the following IWG session, the draft report of previous session proceedings, with the intention of reviewing and adopting the material at the following session.
- 4.11. All scheduled sessions of the EVE IWG shall be included on the GRPE schedule of meetings calendar, through the dedicated site below.
<https://wiki.unece.org/pages/viewpage.action?pageId=917779>
- 4.12. All working documents of the EVE IWG shall be distributed in a digital format, through the dedicated site below.
<https://wiki.unece.org/pages/viewpage.action?pageId=2523151>

4.13. The process of the informal working group, and its sessions, shall be to pursue consensus of all participating members. When consensus cannot be reached, the chair(s) of the IWG shall present the points of contingency to GRPE. The chair(s) may seek guidance from GRPE and the AC.3, as appropriate.

4.14. The chair(s) or designated individual of the EVE IWG shall offer regular progress updates, verbally, to GRPE, utilizing an informal document, as needed.

5. Timeline

The projected timelines, outlined below, represent the current state of play and will be regularly reviewed and updated to reflect the latest timeline objectives, progress and feasibility.

January 2024

- GRPE Submission of the Terms of Reference renewal for consideration.
- GRPE Submission of UN GTR No. 21 phase 2 amendments, as a working document, for consideration.
- GRPE Submission of UN GTR No. 22 phase 2 amendments, as a working document, for consideration.
- GRPE Provide update on the future framework of the UN GTR on in-vehicle battery durability for electrified heavy-duty vehicles.

June 2024

- WP.29 Submission of UN GTR No. 21 phase 2 amendments, as a working document, for consideration by AC.3.
- WP.29 Submission of UN GTR No. 22 phase 2 amendments, as a working document, for consideration by AC.3.

October 2024

- GRPE Submission of the new UN GTR on in-vehicle battery durability for electrified heavy-duty vehicles, as an informal document, for feedback.

March 2025

- GRPE Submission of the new UN GTR on in-vehicle battery durability for electrified heavy-duty vehicles, as a working document, for consideration.

June 2025

- WP.29 Submission of the new UN GTR on in-vehicle battery durability for electrified heavy-duty

vehicles, as a working document, for consideration by AC.3.

March 2026

- GRPE Submission of UN GTR No. 21 phase 3 amendments, as a working document, for consideration.
- GRPE Submission of UN GTR No. 22 phase 3 amendments, as a working document, for consideration.

June 2026

- WP.29 Submission of UN GTR No. 21 phase 3 amendments, as a working document, for consideration by AC.3.
- WP.29 Submission of UN GTR No. 22 phase 3 amendments, as a working document, for consideration by AC.3.

March 2027

- GRPE Submission of phase 2 of the UN GTR on in-vehicle battery durability for electrified heavy-duty vehicles, as a working document, for consideration.

June 2027

- WP.29 Submission of phase 2 of the UN GTR on in-vehicle battery durability for electrified heavy-duty vehicles, as a working document, for vote by AC.3.