

Terms of Reference for Informal Working Group on Electric Vehicles and Environment (EVE)

1. PROCEDURAL BACKGROUND

The executive committee of the 1998 Agreement (AC.3) gave, in November 2011, its general support to a joint proposal by the United States, Japan, and the European Union to establish two working groups to address safety and environmental issues associated with electric vehicles (ECE/TRANS/WP.29/AC.3/32)¹. The proposal (ECE/Trans/WP.29/2012/36. and its Corr1) submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) at its March 2012 session with China joining as a cosponsor with the European Union, Japan and the United States was formally adopted at that time. Current sponsors of the EVE IWG in November 2021 include Canada, China, the European Union, Korea, Japan and the United States.

The adopted proposal highlights the objectives of the first mandate for the two informal working groups as follows:

- (a) Exchange information on current and future regulatory requirements for EVs in different markets;
- (b) Minimize the differences between these regulatory requirements, with a view toward facilitating the development of vehicles to comply with such requirements; and
- (c) Where possible, develop common requirements in the form of one or more UN global technical regulations (GTR).

The EVE IWG's first terms of reference (GRPE-65-04-Rev.1) was presented at the 65th GRPE session in January 2013. By November 2014, the EVE IWG completed its first mandate which included the development of a reference guide for environmentally-related EV requirements (ECE-TRANS-WP29-2014-81). At this time the EVE IWG proposed a new mandate in two parts, to conduct additional research, and to identify recommendations suitable for the development of GTR(s)(ECE/TRANS/WP.29/2014/88).

¹ (European Union, Japan and the USA) Proposal for establishing two Informal Working Groups addressing the safety and environmental requirements for electric vehicles to enhance regulatory cooperation including developing Global Technical Regulations in the framework of the 1998 Agreement

By November 2016, the EVE IWG put forth a proposal to develop amendments to GTR No. 15 and to continue research items on environmental requirements for electric vehicles (ECE-TRANS-WP.29-2016-116e). The established timelines in this proposal extended both parts of EVE IWG's new mandate to November 2019. The EVE IWG's proposal was given authorization by AC.3 in March 2017 (ECE-TRANS/WP.29/2016/46).

In June 2018 at the GRPE's seventy-seventh session, the GRPE expressed the will to develop the GTR as a standalone GTR rather than as an amendment to GTR No. 15. AC.3 modified the mandate to develop the UN GTR on DEVP as a standalone at its session in March 2019 (ECE/TRANS/WP.29/2019/33).

The IWG on EVE presented a draft status report to GRPE in May 2019 on the work on the method of stating energy consumption and research on in-vehicle battery durability and performance. Based on the content of this status report, the IWG on EVE requested authorization to continue work for one additional year on the UN GTR on power determination, which was subsequently endorsed by WP.29 in November 2019 (ECE/TRANS/WP.29/2019/124e). The EVE IWG also indicated in their status report in May 2019, that there is sufficient information to allow a new UN GTR to be developed on in-vehicle battery durability. A request for authorization to develop a new GTR on in-vehicle battery durability was approved by WP. 29 at its November 2019 session (ECE/TRANS/WP.29/AC.3/57e).

The proposal (ECE/TRANS/WP.29/2020/125) and technical report (ECE/TRANS/WP.29/2020/126) for the new UN GTR on DEVP was approved by WP. 29 November 2020 session and established in the Global Registry as GTR No. 21 on January 18, 2021.

The purpose of this document is to set forth updated Terms of Reference (ToR) for the Electric Vehicles and Environment (EVE) informal working group that highlight the IWG's current goals and objectives. The new Terms of Reference are based on document GRPE-65-04-Rev.1. The current goals of the EVE IWG are to:

- (a) Develop a new UN GTR on in-vehicle battery durability of electrified vehicles and the subsequent phases of development for this GTR
- (b) Update and maintain GTR No. 21 on DEVP as necessary, and develop a candidate test method as available and needed.
- (c) Continue to support the Group of Experts on Energy Efficiency (GEEE) as they lead and continue the work on the method of stating energy consumption for upstream emissions of electrified vehicles.

2. INTRODUCTION

The EVE informal working group will provide an international forum for examining a range of issues and sharing information about the developing technologies, current regulatory activities, and policy approaches, including the important considerations such as research priorities, current projects and the deployment of EVs. It is intended that the discussions will encompass all types of road vehicles with

electrical propulsion². Where possible and most important, the EVE informal working group will continue to work to identify areas of common or shared research to advance understanding and to identify other potential gaps where coordination can enhance understanding.

The EVE informal working group intends to pay significant attention and discuss the possibility to develop new GTRs or amend adopted GTRs, as necessary, in line with the scope of the 1998 Agreement. Among the important potential considerations regarding the environmental aspects of EVs, to be examined by the EVE informal working group, the EVE IWG will also consider the developments in electrified vehicle technologies over time to assess the applicability of new methods or procedures necessary to determine the operational performance, including: cold starts, battery durability, determination of vehicle power, charging performance of the battery drive system, and end-of-life battery considerations including battery recycling and repurposing, to name a few. With the continuing efforts to foster the development of electro-mobility, there will be continuing opportunities to share information on issues such as infrastructure build-up, standards for charging infrastructure and other standardization issues, and support for electrical vehicles market introduction and promotion.

In the event the EVE informal working group identifies the need to develop new GTRs following a thorough review of the issues and potential areas for regulatory harmonization, a recommendation would be brought to GRPE and then to AC.3 for consideration regarding potential GTR activities.

Since its first meeting in June 8, 2012, the EVE IWG has successfully accomplished the following from its first two mandates:

- *Research on environmental requirements for electric vehicles, including research on electrified vehicle battery durability and the development of a Microsoft Excel based model to evaluate the energy consumption of electrified vehicles³.*
 - *A technical document completed in November 2014 reflects the outcome of these research items⁴.*
- *Electric Vehicles Regulatory Reference Guide⁵*
- *Development of UN GTR No. 21 on determining the system power of electrified vehicles. Established in the global registry on January 18, 2021^{6,7}.*

² Noting the importance of commonly understood definitions and classifications, the EVE informal working group will also collaborate closely with the Vehicle Propulsion System Definitions (VPSD) informal working group recently endorsed at the March 2012 WP.29.

³ (ECE/TRANS/WP.29/AC.3/46)

⁴ GRPE-73-24

⁵ (ECE/TRANS/WP.29/2014/81) and (ECE/TRANS/WP.29/AC.3/32)

⁶ <https://unece.org/sites/default/files/2021-01/ECE-TRANS-180a21e.pdf>,

⁷ (ECE/TRANS/WP.29/AC.3/53) and (ECE/TRANS/WP.29/2019/33)

- *Development of UN GTR No. 22 on determining the system power of electrified vehicles. Established in the global registry April 19, 2022.*
- *A proposal to develop a new UN GTR on in-vehicle battery durability of electrified vehicles, approved by WP. 29 in November 2019.*

The EVE IWG is currently working on:

- *The development of a new UN GTR on heavy-duty in-vehicle battery durability of electrified vehicles; and*
- *Supporting the Group of Experts on Energy Efficiency who are now leading the work on the evaluation of energy consumption for upstream emissions of electrified vehicles.*

There is still work to be done by the EVE IWG in order to advance the harmonization of technical regulations concerning several aspects of electric vehicles, as well as the conversion of these Global Technical Regulations under the 1998 Agreement, including but not limited to the next phases of the planned developments for the new UN GTR on in-vehicle battery durability for electrified vehicles and possible future developments on UN GTR No. 21 with respect to the development of candidate test methodologies and future amendments to UN GTR No. 21, on an as needed basis.

The EVE IWG intends to request a new mandate to highlight new UN GTR work by the IWG which will be implemented in phases, and to carry out the new goals established in the new Terms of Reference. This new mandate will be set to expire in January 2024, after the final phase development of the new UN GTR on in-vehicle battery durability of electrified vehicles.

3. TERMS OF REFERENCE

The informal working group shall focus its work on the following activities:

1. The informal working group will initially develop the means and resources to address the issues before the EVE informal working group, including:
 - a. Advancing the development of the new UN GTR on in-vehicle battery durability of electrified vehicles and subsequent phases of such GTR.
 - i. The EVE IWG will also evaluate how to implement the in-vehicle battery durability UN GTR for heavy-duty vehicles.
 - b. Staying apprised of the need to update and amend UN GTR No 21. and developing future candidate methods, as necessary.
 - c. Supporting the work of the Group of Experts on Energy Efficiency (GEEE) related to the evaluation of upstream emissions of electrified vehicles.

2. The available literature, including standards and regulations, shall be screened and analyzed for potential identification and recommendation to AC.3 of future regulatory action.
3. The informal working group will make every effort to stay abreast of developing concepts and implementation strategies for the development of the possible GTRs and the introduction of EVs, through regular dialogue and expert presentations.
4. All of these considerations regarding environmental performance aspects and other issues should be reviewed and coordinated in the context of the existing work and mandates of other active informal working groups. This will ensure the EVE IWG activities are unique or complement the activities of the other IWGs.

4. RULES OF THE PROCEDURES

1. The informal group is open to all participants of GRPE. A limitation of number of participants from any country and organization to participate in the informal group is not foreseen.
2. Sessions shall be held in agreement with the majority of the participants based on the joint proposal by the chair, vice-chairs and secretariat.
3. A Chairpersons, Vice-Chairs and a Technical Secretary will govern the informal working group.
4. Co-chairmanship is taken by the representatives of the United States and the European Commission and the Vice-Chairs are taken by the representatives of Japan and China for the period from November 2021 to January 2024
5. The Technical Secretary is taken by the representative(s) of Canada of the period from November 2021 to January 2024
6. The official language of the informal group will be English.
7. All documents and/or proposals shall be submitted to the Technical Secretary of the group in a suitable electronic format in advance of the meeting. The group may refuse to discuss any item or proposal, which has not been circulated 10 working days in advance.
8. An agenda and related documents will be circulated to all members of the informal group at least two weeks in advance of all scheduled meetings. The first item of the provisional agenda for each session shall be adoption of the agenda and the second item of the provisional agenda shall be discussions, matters and adoption of Report of the previous session.

9. The process will pursue consensus. When consensus can not be reached, the Chairperson of the group shall present the different points of view to GRPE. The chairperson may seek guidance from AC.3 and GRPE as appropriate.
10. Draft meeting reports will be circulated in advance of the next session with the view to be formally adopted at the next meeting.
11. The progress of the informal group will be reported to GRPE orally or as an informal document by the chairperson or another participant of the group.
12. All working papers shall be distributed in digital form. A specific website created in the UNECE wiki pages (<https://wiki.unece.org/pages/viewpage.action?pageId=2523151>) is available and link will be provided to all parties involved.
13. All future EVE IWG meetings will be included on the UNECE wiki calendar.

5. TIMELINES

1. June 2012
 - a. EVE IWG was established following the approval of WP.29 *ECE/TRANS/WP.29/AC.3/32*
2. November 2014
 - a. First mandate of EVE IWG completed, including the development of a reference guide for environmentally-related EV requirements (WP.29 of *ECE/TRANS/WP.29/AC.3/32*)
 - b. A second mandate was established
3. November 2016
 - a. Second mandate of EVE IWG completed
 - i. Technical document GRPE-73-24 presented
4. March 2019
 - a. Approval for the EVE IWG to develop the UN GTR for power determination of electrified vehicles.
5. June 2020
 - a. EVE IWG submits a request for authorization to develop a new GTR on in-vehicle battery durability
6. January 2021:
 - a. Establishment of the UN GTR No. 21 in the Global Registry
7. November 2021:
 - a. IWG on EVE presents final draft of the first phase of the new UN GTR text on in-vehicle battery durability for electrified vehicles at the GRPE June 2021 session.
8. January 2022:

- a. EVE IWG begins evaluation of HDV consideration for in-vehicle battery durability requirements and subsequent steps of the GTR development
 - b. January 2023: EVE IWG informs GRPE of next steps for the development of battery durability requirements for heavy duty vehicles and other subsequent steps of GTR development as deemed appropriate.
9. January 2023: EVE proposes to GRPE the development of a new GTR on in-vehicle battery durability for heavy duty vehicles
10. January 2024: IWG on EVE provides a status update and draft copy of the development of the durability UN GTR on heavy-duty vehicles as an informal document for further discussion and recommendation. The IWG on EVE provides updates on the future framework for heavy-duty vehicle related durability UN GTR decisions.
11. June 2024: IWG on EVE provides a draft UN GTR to the June 2024 meeting of GRPE as a working document.
12. June 2021-January 2024:
 - a. IWG on EVE continues information gathering on possible modifications to the in-vehicle battery durability UN GTR No 22 and develops amendments to the UN GTR No 22 for consideration by WP.29 and AC.3, as deemed appropriate.
13. May 2021 - June 2023:
 - a. EVE IWG supports the Group of Experts on Energy Efficiency on the method for stating energy consumption from upstream emissions of electrified vehicles.
14. November 2021 – June 2023
 - a. Consideration of a candidate test method and further validation testing for UN GTR No. 21
 - b. Consideration of family concept
 - c. Consideration of other GTR amendments as necessary