



Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****XXXth session**

Geneva, DD Month Year

Item XX.X of the provisional agenda

**Items on which the exchange of views and data
should continue or begin:****Electric vehicles and the environment****Proposal for authorization to continue development of the gtr
to determine power in electrified vehicles and for
authorization to develop a gtr on in-vehicle battery durability
for electrified vehicles****Submitted by the representatives of Canada, China, the European
Union, Japan and the United States of America*****Commented [G[1]]:** All still support?

The text reproduced below prepared by the representatives of Canada, China, the European Union, Japan and the United States of America to begin a new mandate of the informal working group on Electric Vehicles and the Environmental (EVE). In this new mandate, the EVE informal working group (IWG) would complete the development of a gtr on electrified vehicle powertrain performance, develop a gtr on in-vehicle battery durability, and support the work of developing a method of stating energy consumption of electrified vehicles, led by the Group of Experts for Cleaner Electricity Production. This new mandate is based on ECE/TRANS/WP.29/AC.3/40, the EVE IWG's previous first and second mandates, and the modification to the mandate in ECE/TRANS/WP.29/2019/33.

* In accordance with the program of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. Mandate and Objectives

1. In the framework of the 1998 Agreement and under continued work by the informal working group (IWG) on Electric Vehicles and the Environment (EVE), the main objective of this proposal is to seek authorization for the EVE IWG to begin a new mandate, specifically to:

- (a) Continue testing and development of the gtr to establish a validated test procedure for determining the powertrain performance of electrified vehicles;
- (b) Develop a gtr on the topic of in-vehicle battery performance and durability
- (c) Support the Group of Experts for Cleaner Electricity Production (CEP) as needed, in their work examining a method of stating energy consumption for electrified vehicles.

2. The IWG on EVE and IWG on Worldwide harmonized Light vehicles Test Procedure (WLTP) will continue collaborating, to ensure each group's work is complimentary to the other, and avoids any duplication of effort.

II. Introduction

3. The IWG on EVE was set up in June 2012 following the approval by WP.29 of ECE/TRANS/WP.29/AC.3/32. This document established two distinct IWGs to examine environmental and safety issues related to EVs (IWGs on EVE, reporting to the Working Party on Pollution and Energy (GRPE) and the IWG on Electric Vehicle Safety (EVS), reporting to the Working Party on Passive Safety (GRSP)). As the two groups were formed at WP.29, they also reported to this forum directly. The proposal was supported by the European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), the National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) of the United States of America, the Ministry of Industry and Information Technology (MIIT) of China, and Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT).

4. During the first mandate of the IWG on EVE, the IWG aimed to accomplish the following objectives, which were successfully completed by November 2014:

- (a) Develop a priority list of topics to address the most timely and significant considerations before the IWG on EVE;
- (b) Understand and document the current considerations of Electric Vehicles (EVs) under the work of other established informal working groups: the IWGs on Electric Vehicle Safety (EVS), WLTP, Heavy Duty Hybrids (HDH), Environmental and Propulsion unit Performance Requirements (EPPR), and on Vehicle Propulsion System Definitions (VPSD);
- (c) Establish a mechanism for sharing information and on-going research on topics related to EVs and the environment;
- (d) Develop a reference guide for environmentally-related EV requirements already established or being considered by Contracting Parties (EV Regulatory Reference Guide (ECE/TRANS/WP.29/2014/81)).

5. The Guide¹ (ECE/TRANS/WP.29/2014/81), based on the information provided by the Contracting Parties and IWGs, presented the existing requirements relating to

¹ Available at: www.unece.org/trans/main/wp29/wp29wgs/wp29gen/gen2014.html

environmentally-related EV attributes at the time of the Guide's development (September 2013). As presented in Chapter 5 of the Guide, the analysis of such information led to the identification of gaps in requirements that could be addressed through the development of new gtr(s), and/or through supplementing the gtr(s) that are currently under development (i.e. WLTP, EPPR), and/or through other suitable efforts, like research.

6. Subsequently, a second mandate for the IWG on EVE, divided into Parts A and B was approved in November 2014 by AC.3 to conduct additional research to address the recommendations outlined in Chapter 5 of the Guide and EV power determination, and develop gtr(s), if appropriate. The second mandate was separate from the IWG on EVS. Parts A and B of the second mandate addressed the following:

gtr-related issues addressed in Part A and B.

(a) Battery performance and durability (recommendation 5.3, ECE/TRANS/WP.29/2014/81);

(b) Determining the powertrain performance (maximum power and torque) of EVs.

Information-sharing issues addressed in Part A and B.

(a) Method of stating energy consumption (recommendation 5.2, ECE/TRANS/WP.29/2014/81);

(b) Battery recycling/recyclability (recommendation 5.4, ECE/TRANS/WP.29/2014/81).

7. In November 2016, Part A of the second mandate was completed. At June the 2016 GRPE meeting, the EVE IWG presented a technical document (GRPE-73-24) that indicated the areas of research to pursue on battery performance and durability. It indicated that there was sufficient information available to move forward with a gtr on determining the powertrain performance of electrified vehicles. The technical report also recommended that battery recycling or recyclability was not a topic suitable within the EVE IWG forum to pursue. The EVE IWG indicated that it was willing to support efforts to develop a method of stating energy consumption of electrified vehicles if another body within the UNECE framework led them, but that the EVE could not lead the work independently as it required the input of experts in the generation and distribution of electricity.

8. The EVE IWG pursued several topics in part B of the second mandate, based on the findings from part A in the technical report presented to GRPE in June 2016 (GRPE-73-24):

(a) Developing a gtr for powertrain performance

(b) Continuing research on in-vehicle battery durability and performance

(c) Finding new leadership for the previous method of stating energy consumption work

9. AC.3 approved document ECE/TRANS/WP.29/2019/33 in March 2019, which instructed the EVE IWG to develop the gtr for power determination of electrified vehicles as a standalone gtr, rather than an annex to gtr no. 15.

10. The EVE IWG 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 EVE IWG requests authorization to begin a new mandate, which would complete the gtr on EV power determination, pursue a new gtr on in-vehicle battery durability, and support the CEP as needed on developing a method of stating energy consumption. The gtr on in-vehicle battery durability will use the

deterioration factor concept already used for air pollutant emissions in internal combustion engine vehicles, and will consider the use of deterioration factors for range. The conclusion of the electrified vehicle powertrain performance gtr will include additional validation testing to address concerns raised from the first round of validation testing.

III. Areas of work

11. The EVE IWG's recommendation for areas of work are below:

(a) Determining the powertrain performance

12. Though ECE/TRANS/WP.29/2019/33 envisioned completion of the power determination gtr in May 2019, the validation testing raised issues which, in the views of the EVE IWG, require additional validation testing. The additional testing will ensure the assessment of most vehicle architectures and ensure that the adjustments in the test procedure made address concerns raised during the initial validation testing.

(b) Battery performance and durability

13. Research and modelling during the second mandate has indicated that a gtr for in-vehicle battery durability can be started, which:

- a. Establishes minimum durability requirements and developing guidelines for acceptable evidence that the requirements will be met;
- b. Establishes measures to prevent substandard products from entering the market;
- c. Allows adequate room for continued development of the regulation as the industry continues to evolve; and
- d. Implements a mechanism for the collection of data that could provide a basis for refining the gtr in the future.

IV. Existing regulations

14. A variety of the regional regulations and directives applicable to various M- and N-category vehicles as well as UN Regulations, such as Regulation No. 85. However, there are very few which apply explicitly to electrified vehicles. Since November 2018, both the EVE and WLTP IWG agreed that a procedure for determining powertrain performance specifically for electrified vehicles should be as a separate new gtr.

V. Timeline

9. The timelines for the new mandate below are target timelines. The plan will be regularly reviewed and updated to reflect progress and feasibility of the timeline.

(a) Determining the powertrain performance:

- (i) June 2019: Approval of the authorization by GRPE to extend the development of the new gtr on powertrain performance;
- (ii) October 2019: Completion of validation testing work and final review of test results and draft gtr changes;
- (iii) November 2019: Approval of new timelines in formal document by AC.3;
- (iv) January 2020: Preliminary draft of gtr text made available;

-
- (v) June 2020:
 - a. Endorsement of the draft gtr based on an informal document by GRPE;
 - b. Transmission of the draft gtr as an official document twelve weeks before the June 2020 session of GRPE;
 - (vi) June 2020: Recommendation of the draft gtr by GRPE;
 - (vii) November 2020: establishment of the gtr by AC.3 in the Global Registry;
 - (b) In-vehicle battery performance and durability:
 - (i) November 2019: Approval from AC.3 to develop a gtr focused on deterioration factors on the topic of battery performance and durability;
 - (ii) November 2019 - March 2020:
 - a. EVE IWG develops gtr text based on deterioration factors, in a manner similar to current requirements for air pollutant emissions from conventional vehicles;
 - b. EVE continues consultation with the WLTP, including the WLTP-E-Lab sub-group and WLTP co-sponsors (Japan and the European Commission);
 - (iii) March 2020 – January 2021:
 - a. EVE conducts validation testing of procedure, presents first results to GRPE in June 2020 and subsequent results in January 2021;
 - b. EVE IWG submits first draft of the procedure to January 2021 session of GRPE;
 - (iv) June 2021:
 - a. Transmission of the final gtr as an informal document twelve weeks before the June 2021 session of GRPE.
 - b. Endorsement of the draft gtr based on an informal document by GRPE;
 - (v) June 2021: Recommendation of the draft gtr by GRPE;
 - (vi) November 2021: establishment of the gtr by AC.3 in the Global Registry;
 - (c) Provide support as requested to the CEP on their work leading the development of a method of stating energy consumption.
-