

**Report of the 66<sup>th</sup> session**  
**Electric Vehicles and the Environment Informal Working Group (EVE IWG)**

Location: Virtual – Webex  
Date: December 06 – 07, 2023  
Time: 05:30 – 08:00 EST

Chairs: Mr. Michael Olechiw (United States of America)  
Ms. Elena Paffumi (European Commission)

Vice-Chairs: Ms. Chen Chunmei (China)  
Mr. Nobunori Okui (Japan)

Secretariat: Mr. Leeson Guay (Canada)

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Day 1 – December 06, 2023, 05:30 EST

1. Introduction, review of agenda, and meeting recap

Documentation

- EVE-65-27e
- EVE-66-01e

Context

The EVE IWG co-chairs addressed members and welcomed everyone to the virtual meeting.

The co-chairs presented the meeting agenda to EVE IWG members, which can be seen below. The agenda was reviewed and adopted by the EVE IWG prior to beginning discussions.

Day 1 – December 06, 2023, 05:30 EST

- Introduction, review of agenda, meeting recap
- HDV GTR – Recap of breakout sessions on c-rate
- HDV GTR – OICA updated positions and test results
- HDV GTR – Japan positions and contributions
- HDV GTR – Review of draft text and discussion of open items

Day 2 – December 07, 2023, 05:30 EST

- Introduction, review of agenda
- HDV GTR – Review of draft text and discussion of open items

- UN GTR 22 – Comments and proposal
- UN GTR 22 – OICA comments on text
- UN GTR 22 – Renewable Energy Directive
- UN GTR 22 – Finalize open items for working draft
- UN GTR 21 – OICA comments on text
- UN GTR 21 – Finalize open items for working draft
- EVE IWG Terms of Reference review and renewal
- Future planning

The EVE IWG secretary briefly reviewed the *Report of the 65<sup>th</sup> EVE IWG session*, highlighting action items and key decisions from the discussions, held in-person in Ottawa, Canada, on October 11 – 12, 2023.

#### Discussion

The co-chair made an announcement indicating that Ms. Elena Paffumi will be the new temporary co-chair of the EVE IWG. The co-chairs mentioned that the decision on a full-time co-chair for the EVE IWG is under consideration by the European Commission (EC)

Upon reviewing the meeting minutes, the co-chairs request some minor modification to the text, which the secretariat implemented and reposted.

#### Action Items

#### Decisions

2. HDV GTR – Recap of breakout sessions on c-rate

#### Documentation

- EVE-66-02e
- EVE-66-03e

#### Context

The drafting coordinator presented a document outlining the outcomes and discussion that took place during the two breakout sessions on the electrified heavy-duty vehicle (eHDV) global technical regulation (GTR).

Following discussions from the 66<sup>th</sup> EVE IWG session, a list of open items were made available to the group as a separate document, EVE-66-18e.

#### Discussion

The drafting coordinator communicated that the draft text of the eHDV GTR has been started based off discussions of the breakout session. Two versions of the eHDV GTR text exist because one will need to be submitted to the Working Party on Pollution and Energy (GRPE). One is a working document and the other is a clean version which eliminates the mark-up. Anything that is agreed upon will be updated accordingly in both draft documents.

#### Action items

#### Decisions

### 3. HDV GTR – OICA updated positions and test results

#### Documentation

- EVE-66-04e

#### Context

A representative from the Organisation Internationale des Constructeurs d'Automobiles (OICA) offered a presentation on their updated positions with regard to the eHDV GTR draft text, providing more information on the availability of test tracks within the United States (U.S.) and interim test results of eHDV battery deterioration.

#### Discussion

OICA representatives stated that due to the urgent political discussions surrounding the Euro 7 regulations, they were unable to develop a comprehensive proposal on the energy throughput methodology or verification method. OICA offered to present this information at the 67<sup>th</sup> EVE IWG session.

The co-chairs asked the drafting coordinator whether they feel these updates on stance have been accurately reflected in the draft text of the eHDV GTR. The drafting coordinator stated that, yes, they feel things have been accurately reflected and that the draft text is now in a position to begin deleting or merging items as the group moves towards finalizing the text.

The co-chairs pointed out in the presentation that OICA is suggesting a testing method that requires the measurement of useable battery capacity (UBC). The drafting coordinator outlined that the group is not specifically prepared to comment on this at this time, however, it was the general consensus of the contracting parties that useable battery energy (UBE) was the preferred approach. So further discussions will still be required on this topic. The drafting coordinator also highlighted that the proposal from OICA is suggesting merging method 1A and 1B, which is a possibility, however, for the submission to the GRPE, perhaps it may be best to leave them separate and communicate that we are considering merging the two. The co-chairs expressed that a general message for the GRPE will need to be considered by the leadership team, as we approach the session in January.

The co-chairs request clarification on which vehicles were used to produce the data presented in the document. It would be valuable to know this information because then we can better understand the results being presented. OICA expressed that they would discuss this internally and get back to the EVE IWG.

The American delegation stated that they understand OICA's position on capacity versus energy and that capacity may be more reproducible. This is a similar situation to combustion engine testing where we require both engine speed and torque. For electric vehicles, voltage is required to be a part of the data to offer the whole testing story, however, it is understood that capacity is more reproducible in testing. When looking at the information on the slides, the standard deviations are not absurd when comparing against variations present in engine testing, so it seems that the UBE and UBC deviations are both reasonable. It is important to remember that batteries have a very high coulomb efficiency and measuring the current in and out of the battery should be easy because this current output does not deteriorate with time. When looking at the presented data and the energy

tests, the differences shown may be what we want to see. Although reproducibility of capacity is high, it reflects coulomb efficiency, which is not necessarily a key parameter when trying to determine battery deterioration. OICA held that so far, they have found that the best results are found in the amperes of the battery. The available energy is based on the current and is like engine torque, and this is what is needed when operating these vehicles. In this regard, we also feel that the coulomb efficiency is a good value to determine aging effects. The American delegation commented that they recognize there are differences in chemistries and if these differences, as well as the current and voltage are not captured then it becomes even harder to evaluate batteries and the different technologies. In literature it is not clear how efficiency changes over time and so there is reference to inform energy efficiency reduction over time.

The Japanese delegation asked whether the battery technologies present in eHDVs are the same as what is in light-duty vehicles (LDV). OICA stated that they cannot comment on future technology other than what has been publicly announced, but the technologies now vary between eHDV and LDV. The Japanese delegation held that they would not be willing to change their position at this time from what they have seen and heard so far.

#### Action items

- OICA to provide energy throughput and verification method proposal at the 67<sup>th</sup> EVE IWG session.

#### Decisions

4. HDV GTR – Japan positions and contributions

#### Documentation

- EVE-66-05e

#### Context

The Japanese delegation presented their positions and comments on the current eHDV GTR text, in addition to their contributions and comments stemming from the eHDV breakout sessions.

#### Discussion

The drafting coordinator expressed that item one, vehicle selection, on the overview page, has not yet been discussed. There needs to be more consideration for random selection but regardless, the Japanese delegation's position and items have been included in the appropriate eHDV GTR documents.

The drafting coordinator requested feedback on a higher speed at the beginning of the test to reduce the testing time overall. The Japanese delegation expressed that if going from manufacturer specifications, it could result in a very long discharge at a specified current rate (c-rate).

The drafting coordinator also communicated that there is further consideration required for whether the group focus on method 1a, 1b and method 2 or focus on method 1 and have method 2 as an optional alternative later.

#### Action items

#### Decisions

5. HDV GTR – Review of draft text and discussion of open items

Documentation

- EVE-66-06e
- EVE-66-07e

Context

This item was set with the objective of continuing discussions on the draft UN GTR on battery performance and durability of eHDVs, for submission, as an informal document, to the 90th GRPE session in January 2024.

The drafting coordinator presented the latest draft version of the document and proceeded to offer an overview of open items, prior to beginning discussions, with the goal of reaching consensus for final submission.

Discussion

The drafting coordinator indicated that in the draft text, items in red still require consensus.

The co-chairs expressed that they feel a valid assessment needs to be made for where the group is at this point in the drafting process. The co-chairs suggested continuing this discussion on day two.

Action items

Decisions

Day 2 – December 07, 2023, 05:30 EST

1. Introduction, review of agenda

Documentation

- EVE-66-16e

Context

The EVE IWG co-chairs addressed members and welcomed everyone to the virtual meeting.

The co-chairs presented the meeting agenda to EVE IWG members. The agenda was reviewed and adopted by the EVE IWG prior to beginning discussions. Modifications to the agenda occurred and have been reflected in EVE-66-16e.

Discussion

OICA commented that there appears to be a World Forum for Harmonization of Vehicle Regulations (WP.29) draft status report of United Nations (UN) GTR No. 22 but that there does not appear to be one for UN GTR No. 21. The drafting coordinator for UN GTR No. 21 expressed that this was brought up at the previous EVE IWG session and that yes, a WP.29 draft status report for UN GTR No. 21 will be developed and posted once prepared.

Action items

- Drafting coordinator to prepare a draft status report of UN GTR No.21 for WP.29 and post for all EVE IWG members to review.

Decisions

2. HDV GTR – Review of draft text and discussion of open items

Documentation

- EVE-66-06e
- EVE-66-07e

Context

This item was set with the objective of continuing discussions on the draft UN GTR on battery performance and durability of eHDVs, for submission, as an informal document, to the 90th GRPE session in January 2024.

The drafting coordinator presented the latest draft version of the document and proceeded to offer an overview of open items, prior to beginning discussions, with the goal of reaching consensus for final submission.

Discussion

The co-chairs requested feedback from contracting parties regarding their timeline for future regulatory timelines that may be impacted or related to the publication of the eHDV GTR. The

American delegation communicated that the U.S. are currently developing the future heavy-duty vehicle regulations and it appears that at this moment it may be quite a long time before they are able to adopt the eHDV GTR once it has been published. The United Kingdom (U.K.) stated that they were in the same situation as the U.S. and that a delay in the publication of the eHDV GTR would be appropriate from their perspective. The Canadian delegation expressed that they are comfortable with a delay to the eHDV GTR publication. The EC stated that they are currently working on heavy-duty vehicle regulations and a delay to the UN GTR publication could help empower them, so there is not a large issue with a slight delay on their side. The EC added that they will confirm this and perhaps revisit this topic at the next EVE IWG session with more certainty. The Japanese delegation stated that they are okay with a publication delay but will discuss internally and confirm at the next EVE IWG session. The drafting coordinator also confirmed that a slight delay would be appropriate. The co-chairs stated that it seems everyone is in agreement at this time and so let us plan for a six-month delay and prepare draft text to review at the next EVE IWG session in preparation for the request to the GRPE at its 90<sup>th</sup> session and WP.29 at the following session.

The Japanese delegation commented that the delay will also need to be considered in the Terms of Reference (ToR) text. The co-chairs requested the secretary to draft text as an asterisk, for inclusion in the ToR. We may also discuss modifying the suggested timeline now before submitting it to the GRPE.

The drafting coordinator requested that EVE IWG members to provide feedback on the latest drafts of the eHDV GTR documents by December 13, 2023. A document outlining the open items will be posted for EVE IWG members immediately following the meeting as EVE-66-18e. The co-chairs suggested that this list of open items puts things into context regarding the delay and the items surrounding the minimum performance requirements (MPR) and metrics used will be a big lift for the group. The American delegation offered that the topic of MPRs was discussed at the previous EVE IWG session and there was a suggestion for these values to be left to the contracting parties when adopting the regulations for their jurisdictions. The EC commented that this proposition still needs to be verified on their side because the eHDV GTR is a part of the Euro 7 regulations. In order to have the eHDV GTR requirements implemented in Euro 7, there needs to be a legal basis and right now that basis is the eHDV GTR. Therefore, if MPRs are not a part of the eHDV GTR then there will be a requirement on our side to develop a legal basis for setting European specific MPRs.

#### Action items

- The Japanese delegation to confirm whether a delay to the publication of the eHDV GTR is appropriate in their situation.
- The EC to confirm whether a delay to the publication of the eHDV GTR is appropriate in their situation.
- The drafting coordinator to prepare draft speaking points regarding a six-month delay to the eHDV GTR.
- The secretariat to note delay in eHDV GTR timelines in the draft ToR document.
- The secretariat to post a list of open items for the eHDV GTR for EVE IWG members following the 66<sup>th</sup> EVE IWG session.

#### Decisions

3. UN GTR 22 – Comments and proposal

### Documentation

- EVE-66-08e

### Context

The Japanese delegation gave a presentation outlining their comments and proposals surrounding UN GTR No.22, specifically virtual mileage (V2X) verification method and corrective action procedure as well as a proposal not to delete the MPR matrix.

### Discussion

The drafting coordinator communicated that the Japanese comments and proposals have already been incorporated into the UN GTR No.22 text and ready for comment and decision.

### Action items

### Decisions

4. UN GTR 22 – OICA comments on text

### Documentation

- EVE-66-09e

### Context

OICA offered a presentation outlining their comments on the draft text of UN GTR No. 22, focusing on Part C 6.5.1, 6.5.2, 6.5.3 and some minor editorial points to Annex 2.

### Discussion

The Japanese delegation highlighted that the working document has already been submitted to the GRPE and so at this point in time, modifications to the text should be kept to a minimum. OICA commented that they agree these points may not all be minor, however, they are necessary so if everyone agrees we can include them in the working document.

The co-chairs requested any thoughts or input to the OICA presentation, noting that there was quite a bit of content presented. The drafting coordinator expressed that some refinement to the draft text presented at the 65<sup>th</sup> EVE IWG session is needed and if we are all in agreement with these edits we can go ahead and include them. It is not clear if the other contracting parties can agree at this time without discussing internally, so perhaps a little more time is required. It is also unclear to what extent changes can be made to the document, as the document has already been submitted. The co-chairs suggested that contracting parties can review the proposal and arrive at a conclusion within one week and provide their feedback to the drafting coordinator. If the items make sense then we should proceed with implementing them. It is just a matter of determining how important these items are to the current draft of UN GTR No. 22. The Japanese delegation stated that they will have their coordination meeting on December 18, 2023 and so they will provide their feedback on UN GTR No. 22 shortly thereafter.

### Action items



- Contracting parties to provide feedback to the drafting coordinator on the OICA proposal by December 14, 2023.

#### Decisions

### 5. UN GTR 22 – Renewable Energy Directive

#### Documentation

- EVE-66-10e

#### Context

The EC presented a document outlining the new European Renewable Energy Directive, which entered into force in November 2023, and includes requirements that may need to be considered for implementation in UN GTR No. 22.

#### Discussion

OICA stated that this topic was brought up at a recent electromobility coordination group, where they have offered feedback suggesting that there may be standardization issues, specifically including the battery set point, as it is not a dynamic parameter but more so a fixed parameter depending on system design. In addition, there are legal issues as the required information is personal and private. OICA believes that this topic should be put on hold for now while discussions are underway with the Directorate General for Internal Market, Industry, Entrepreneurship and SMEs (DG Grow). The EC commented that they will have discussions on this with DG Grow as well. OICA commented that they agree on the point of harmonization because they would like to avoid having many different requirements between the European countries.

The co-chairs requested clarification of whether this is a proposal to include in the UN GTR No. 22. The EC communicated that yes, it is a proposal, however, DG Grow is also aware that the regulatory text has already been submitted and significant changes cannot be made at this time.

The American delegation expressed that state of health (SOH) and state of charge (SOC) are well defined and hopefully we are not diverging from the common definition as the EVE IWG knows it to be. The battery set point is a less familiar term, but we understand it to be the dynamically changing point on the battery management system (BMS) that alleviates damage to the battery, but is not necessarily the point of maximum efficiency of the vehicle. Overall, some of these definitions in the proposal are unclear and require further clarification. This is a battery durability GTR and V2X is included within the GTR so we are not opposed to including these items from the proposal, but particular attention needs to be paid to the definitions of these items and ensuring they do not clash with the EVE IWG's current understanding within the regulatory text.

The co-chairs request that feedback on this item also be provided to the drafting coordinator by December 14, 2023, after internal discussions.

#### Action items

- EVE IWG members to provide feedback on the Renewable Energy Directive proposal to the drafting coordinator by December 14, 2023.

#### Decisions

6. UN GTR 22 – Finalize open items for working draft

Documentation

- EVE-66-11e
- EVE-66-12e

Context

This item was set with the objective of continuing discussions on the draft UN GTR No. 22, for submission, as a formal document, to the 90th GRPE session in January 2024.

The drafting coordinator presented the latest draft version of the document and proceeded to offer an overview of open items, prior to beginning discussions, with the goal of reaching consensus for final submission.

Discussion

Action items

Decisions

7. UN GTR 21 – OICA comments on text

Documentation

- EVE-66-13e

Context

OICA offered a presentation outlining their comments on the draft text of UN GTR No. 21, including proposals for dynamometer accuracy as well as modifications to the tolerance found in the equation of 6.9.2.1.

Discussion

The drafting coordinator highlighted that there may be data that exists to support a 5 % tolerance in the equations. The co-chairs asked whether anyone has any strong objections to this modification at this time. The EC stated that they have no strong opinions. The co-chairs suggested thinking about the proposal internally and if any concerns arise, to provide feedback to the drafting coordinator prior to the next 67<sup>th</sup> EVE IWG session. The text will be added to the draft text as a reminder for the next EVE IWG session.

Action items

- EVE IWG members to consider the OICA proposal and provide feedback to the drafting coordinator for the 67<sup>th</sup> EVE IWG session.

Decisions

8. UN GTR 21 – Finalize open items for working draft

Documentation

- EVE-66-14e

### Context

This item was set with the objective of continuing discussions on the draft UN GTR No. 21, for submission, as a formal document, to the 90th GRPE session in January 2024.

The drafting coordinator presented the latest draft version of the document and proceeded to offer an overview of open items, prior to beginning discussions, with the goal of reaching consensus for final submission.

### Discussion

OICA stated that they are content with removing the square brackets on the intake manifold pressure item at 2 %.

### Action item

### Decisions

## 9. EVE IWG Terms of Reference review and renewal

### Documentation

- EVE-66-15e

### Context

This item was set with the objective of presenting the draft ToR document for the EVE IWG. The ToR requires renewal in January 2024 and will be presented to the GRPE at its 90<sup>th</sup> session, to extend the EVE IWG's mandate.

The secretariat went through the draft ToR document highlighting key items and ensuring all members were supportive of the new additions and had consensus on the proposed timelines.

The secretary indicated that a draft version of the document has been posted on the EVE IWG wiki page.

### Discussion

### Action items

- Secretariat to include an endnote or modification to the ToR document to reflect the potential delay to the publication timelines of the eHDV GTR.
- Secretariat to include a comment regarding the potential inclusion of the European Renewable Energy Directive to UN GTR No. 22.
- Secretariat to include a comment highlighting Phase 2 of UN GTR No. 21 for potential modification after the 67<sup>th</sup> EVE IWG session and prior to submission to the GRPE.

### Decisions

## 10. Future planning

### Documentation

### Context

This item was set to discuss EVE IWG planning and coordination going forward.

#### Discussion

The secretariat confirmed that the 67<sup>th</sup> EVE IWG session will be hosted in Geneva at the European Delegation building, on January 09, 2024, at 14:30 – 17:30 central European time. The invitation has been sent out to all members and posted online. The secretariat reminded all members that if participating in-person, to inform the secretary directly prior to January 04, 2024, so that members will be permitted by security.

The Korean delegation confirmed that they will be hosting an EVE IWG session on April 16 and 17, 2024, in Seoul, South Korea.

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#### Action items

- EVE IWG members to inform the secretariat of in-person participation prior to January 04, 2024.
- Korean delegation to provide further details of EVE IWG session on April 16 and 17, 2024 in Seoul, South Korea, at the 67<sup>th</sup> EVE IWG session.

#### Decisions