

Submitted by the EVE informal working group

Informal document **GRPE-72-23**
72nd GRPE, 11-15 January 2016,
agenda item 10

Electric Vehicles and the Environment (EVE IWG)

1

REPORT TO GRPE 72ND SESSION

Current EVE Mandate Review

2

- **EVE IWG is currently operating under a mandate approved in November, 2014**
 - **Work has been divided into two parts:**
 - ✦ **Part A – Information gathering and recommendations for follow-up work**
 - Calculation of upstream emissions
 - Electrified vehicle durability
 - Determination of electrified vehicle power
 - Battery Recyclability
 - ✦ **Part B – Potential development of GTR's related to durability and power determination**

EVE Roadmap, Part A: Jun 2015-Jan 2016

(EVE-13-06-Rev1e)



Task	start date	end date	status	--	EVE-13	--	EVE-14	EVE-15	--	EVE-16	--	EVE-17
				Nov-14	Jan-15	Mar-15	Apr-15	Jun-15	Jun-15	Fall-15	Nov-15	Jan-16
				WP.29	GRPE	WP.29	TBD	GRPE	WP.29	TBD	WP.29	GRPE
Approval of EV Regulatory Reference Guide by AC.3/WP.29 (ECE/TRANS/WP.29/2014/81)			completed									
Approval of new EVE mandate by AC.3/WP.29 (ECE/TRANS/WP.29/2014/88, WP.29-164-15)			completed									
(i) Conduct additional research to support Guide recommendations:	Nov-14	Jun-16	on-going									
Battery performance and durability												
Literature review	Jan-15	Jun-15	started									
Work on literature review recommendations	Jun-15	Dec-15										
Preparation of status report	Nov-15	Dec-15										
Determining power of EVs												
Review of motivation and scope	Jan-15	Jan-15	started									
Gathering information and summary of status and positions	Feb-15	Jun-15										
- making questionnaire												
Summary and analysis of previous works and existing standards	Jun-15	Oct-15										
Report Part A works to EVE	Oct-15	Nov-15										
Method of stating energy consumption												
Literature review	Jan-15	April-15	started									
Data collection	May-15	Sept-15										
Method development	Oct-15	Nov-15										
Battery recyclability												
	XXXX	XX	XX									
Status report from each subgroup	--	Jan-16										
(ii) Identify which recommendations are suitable for the development of GTR(s)	Jan-16	Mar-16										
(iii) Draft workplan developed by subgroups, EVE group	Jan-16	Mar-16										
Consultation, discussion within the EVE IWG	Jan-16	Mar-16										
Consultation, discussion with other GRPE IWGs: WLTP (E-lab sub-group), EPPR, HDH experts	Jan-16	Mar-16										
(iii) Draft requests for GTR development prepared by appropriate subgroups	Apr-16	Jun-16										
Consultation, discussion within the EVE IWG	Apr-16	Jun-16										
Consultation, discussion with other GRPE IWGs: WLTP (E-lab sub-group), EPPR, HDH experts	Apr-16	Jun-16										
Informal GRPE discussion on workplan and requests for GTR development	--	Jun-16										
Informal WP.29 discussion on workplan and requests for GTR development	--	Jun-16										
Finalize workplan and requests for GTR development	Jul-16	Nov-16										
Formal AC.3 consideration and approval	--	Nov-16										
EVE Part B and GTR development initiates	--	Nov-16										

EVE-16 meeting

(October 19-20, 2015, Ottawa, Canada)

4

- **Purpose:** To continue work on Part A of the EVE mandate, with updates on work in sub-groups:
- **EVE-16 discussion:**
 - Updates from other IWGs: WLTP, EPPR, EVS
 - Method of Stating Energy Consumption (China)
 - ✦ Continued literature review to investigate EV energy consumption evaluation methods by various countries
 - ✦ Presented 1st draft of Excel model to calculate energy consumption of electric vehicles, including upstream emissions
 - ✦ Provided 1st draft of reference document explaining calculation methodology and path forward to update Excel model

EVE-16 meeting

(October 19-20, 2015, Ottawa, Canada)

5

- **EVE-16 discussion (continued):**
 - **Electrified Vehicle Durability (USA and Canada)**
 - ✦ **Members discussed feedback of 1st draft of EV durability literature review**
 - ✦ **Author of EV literature review (FEV) presented findings and responded to comments which had been submitted by members**
 - **FEV began work to address comments and finalize report**
 - ✦ **Assigned small subgroup to begin drafting a document consolidating EVE findings on battery durability and options for a path forward**

EVE-16 meeting

(October 19-20, 2015, Ottawa, Canada)

6

- **EVE-16 discussion (continued):**
 - Determination of Powertrain Performance of HEVs (Germany and Korea)
 - ✦ ISO and SAE efforts to develop procedures to determine EV power was presented
 - ✦ Reviewed responses from members on EVE-15 questionnaire about EV power determination
 - ✦ Discussed coordination with WLTP IWG and assessed path forward, timelines and scope of work to meet needs of WLTP IWG
 - ✦ Formed power determination subgroup (which included members from WLTP EV subgroup) and hosted initial subgroup teleconference

EVE-17 meeting

(January 11, 2016, Geneva)

7

- **Purpose**: To continue work on Part A of the EVE mandate, with updates on work in sub-groups:
- **EVE-17 discussion**:
 - Updates from other IWGs: WLTP, EPPR, EVS
 - Method of Stating Energy Consumption (China)
 - ✦ Provided updated 2nd draft of Excel model to calculate energy consumption of electric vehicles, including upstream emissions
 - ✦ Provided 2nd draft of reference document explaining calculation methodology and path forward to update Excel model
 - ✦ Provided template for members to submit data on regional electricity grid (members to submit by February 15th)

EVE-17 meeting

(January 11, 2016, Geneva)

8

- EVE-17 discussion (continued):
 - Electrified Vehicle Durability (USA and Canada)
 - ✦ FEV provided 2nd draft of EV durability literature review, completion targeted for EV-18 in April 2016
 - ✦ Subgroup provided 1st draft of *EVE IWG Status Report on Battery Performance and Durability* and discussed options for path forward (comments from members requested by February 1st, 2016)
 - ✦ Met with representatives of WLTP to ensure coordination of work developing durability requirements for EV
 - WLTP to determine requirements for application of anaged battery or other components, and EVE to determine appropriate ageing techniques

EVE-17 meeting

(January 11, 2016, Geneva)

9

- EVE-17 discussion (continued):
 - Determination of Powertrain Performance of HEVs (Germany and Korea)
 - ✦ Japan provided their position on HEV System Power
 - ✦ System Power subgroup provided results of effort to screen methods to determine power of EVs and proposed reference (chassis dyno) and candidate (mathematical & component testing) methods
 - ✦ Updated outcome of 1st subgroup meeting (which included members of WLTP IWG) and path forward
 - ✦ Proposed plan for preparation of informal documents / recommendation for an addendum that could be integrated into GTR 15 and a request to GRPE and AC.3 in the coming months
 - ✦ Target AC.3 decision in November 2016 on whether to authorize the development of addendum integrated in GTR 15
 - ***Propose EVE-18 in China, the week of April 11, 2016 in China***

EVE Roadmap, Part A: Jan - Nov 2016

(EVE-13-06-Rev1e)

Task	start date	end date	status	EVE-17	--	EVE-18	EVE-19	--	--
				Jan-16	Mar-16	Apr-16	Jun-16	Jun-16	Nov-16
				GRPE	WP.29	TBD	GRPE	WP.29	WP.29
Approval of EV Regulatory Reference Guide by AC.3/WP.29 (ECE/TRANS/WP.29/2014/81)			completed						
Approval of new EVE mandate by AC.3/WP.29 (ECE/TRANS/WP.29/2014/88, WP.29-164-15)			completed						
(i) Conduct additional research to support Guide recommendations:	Nov-14	Jun-16	on-going						
Battery performance and durability									
Literature review	Jan-15	Jun-15	started						
Work on literature review recommendations	Jun-15	Dec-15							
Preparation of status report	Nov-15	Dec-15							
Determining power of EVs									
Review of motivation and scope	Jan-15	Jan-15	started						
Gathering information and summary of status and positions	Feb-15	Jun-15							
- making questionnaire									
Summary and analysis of previous works and existing standards	Jun-15	Oct-15							
Report Part A works to EVE	Oct-15	Nov-15							
Method of stating energy consumption									
Literature review	Jan-15	April-15	started						
Data collection	May-15	Sept-15							
Method development	Oct-15	Nov-15							
Battery recyclability									
	XXXX	XX	XX						
Status report from each subgroup	--	Jan-16							
(ii) Identify which recommendations are suitable for the development of GTR(s)	Jan-16	Mar-16							
(iii) Draft workplan developed by subgroups, EVE group	Jan-16	Mar-16							
Consultation, discussion within the EVE IWG	Jan-16	Mar-16							
Consultation, discussion with other GRPE IWGs: WLTP (E-lab sub-group), EPPR, HDH experts	Jan-16	Mar-16							
(iii) Draft requests for GTR development prepared by appropriate subgroups	Apr-16	Jun-16							
Consultation, discussion within the EVE IWG	Apr-16	Jun-16							
Consultation, discussion with other GRPE IWGs: WLTP (E-lab sub-group), EPPR, HDH experts	Apr-16	Jun-16							
Informal GRPE discussion on workplan and requests for GTR development	--	Jun-16							
Informal WP.29 discussion on workplan and requests for GTR development	--	Jun-16							
Finalize workplan and requests for GTR development	Jul-16	Nov-16							
Formal AC.3 consideration and approval	--	Nov-16							
EVE Part B and GTR development initiates	--	Nov-16							

Upcoming Meetings and Next Steps

11

- **Week of April 11, 2016: EVE-18 meeting (China)**
 - Decision on recommendations to GRPE
 - Initiate drafting of recommendations
 - ✦ Recommendations could be a future GTR, and Annex to an existing GTR or a technical report
- **June, 2016: EVE-19 meeting and GRPE session**
 - Informal GRPE discussion and agreement on EVE recommendations and workplan (formal approval by WP.29 in November 2016, Part B of EVE mandate initiates)

Expected Outcomes & Recommendations

12

- **Determining System Power**
 - Expect to recommend development of Annex to GTR 15 for power determination to meet needs of WLTP at GRPE in June 2016
- **Battery Durability**
 - Will produce report on battery ageing and durability for GRPE in June 2016
 - Expect to recommend development of Annex to GTR 15 for battery ageing/durability to meet needs of WLTP at GRPE in June 2016
- **Determining Energy Consumption**
 - Will produce report on determining energy consumption for GRPE in June 2016