

Submitted by the expert of OICA



Informal document **GRPE-82-33**

82nd GRPE, 12-15 Janvier 2021

agenda item 9.(b).

UNECE EVE-IWG In-Vehicle Battery Durability

Level of the Minimum Performance Requirement (MPR)

Statement EVE leadership:

The base for the level of the MPR should be public available data which are currently as follows:

- TEMA simulation model (Developed by JRC)
- GeoTab database (Fleet data study, presented first time on 16th of December 2020)
- Warranty condition from OEM (Survey for PEV M1 vehicles)

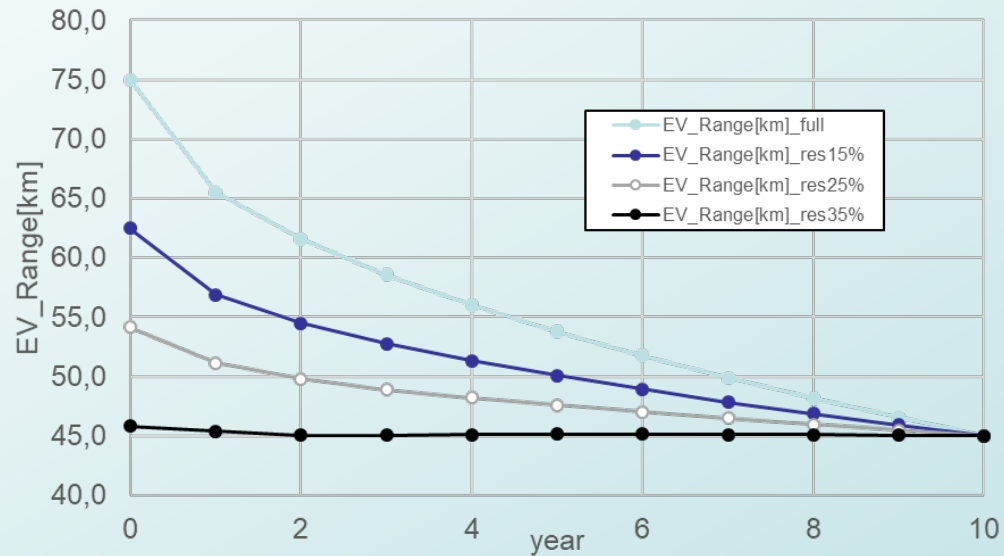
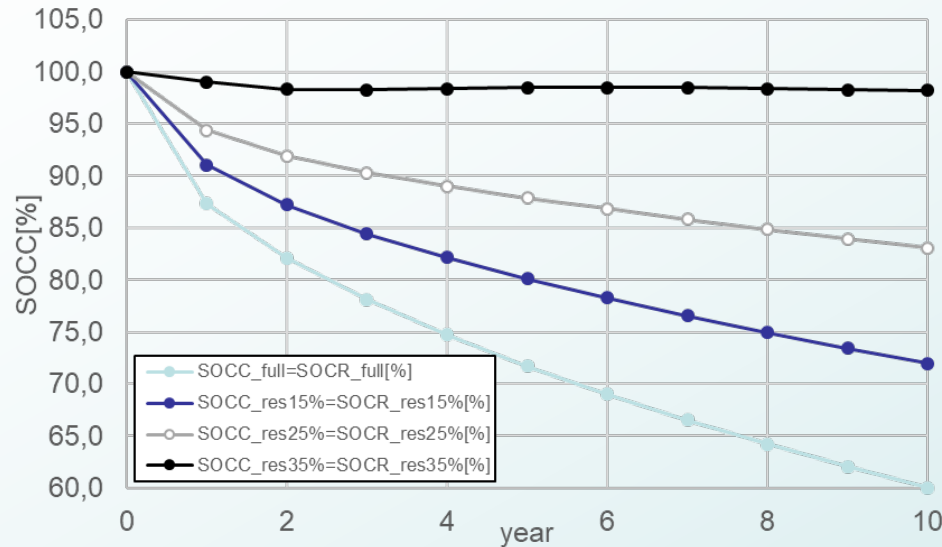
Statement OICA:

- OEM are not able to present comprehensive durability market data with statistical relevance
- OICA does not see TEMA model as publically available and has many still open questions
- The GeoTab database is a simulation based on maximum 2 year old vehicles
Data acquisition method and processing needs further investigation
- Warranty condition from OEM are not only technically based

- ➔ **The different views on the input data for the MPR leads to different proposals for the level**
- ➔ **The level of the MPR should exclude substandard products from the market**

Level of the Minimum Performance Requirement (MPR)

MPR levels proposed based on TEMA have the clear assumption of a capacity reserve for BEV (15%) and PHEV (25%).



*source:
Toyota estimation

Battery reserve has a significant negative impact on driving electric consumption and vehicle price/running costs:

- Additional weight with reserve → constantly higher energy consumption during operation
- Additional costs with reserve → for less range degradation over lifetime, more battery is required
- Higher consumption footprint (environment); higher running costs (customer)
- Less affordable vehicles as consequence (customer, environment)

→ Excessive MPRs based on large reserves are slowing down the spread of electrification of mobility and will reduce the positive environmental impact of these vehicles

Level of the Minimum Performance Requirement (MPR)

EVE leadership proposal for the MPR level (from GTR draft):

Passenger cars	OVC-HEV	PEV
5 years or 100,000 km, whichever comes first	[90%]	[80%]
8 years or 160,000 km, whichever comes first	[80%]	[70%]

Vans	OVC-HEV	PEV
5 years or 100,000 km, whichever comes first	[90%]	[80%]
8 years or 160,000 km, whichever comes first	[80%]	[70%]

OICA proposal for the MPR level (EVE-41-02):

Passenger cars	OVC-HEV	PEV
5 years or 100,000 km, whichever comes first	[70%]	[70%]

Vans	OVC-HEV	PEV
To be decided	Monitoring	Monitoring

- No technical justification, why requirement for PHEV should be more stringent
- The proposed values would require an additional artificial capacity reserve
- OICA supports the Japan proposal on a single checking point for Phase 1: 5 years/100k or 8 years/160k and not both

- The proposed values would be achievable without adding the artificial reserve

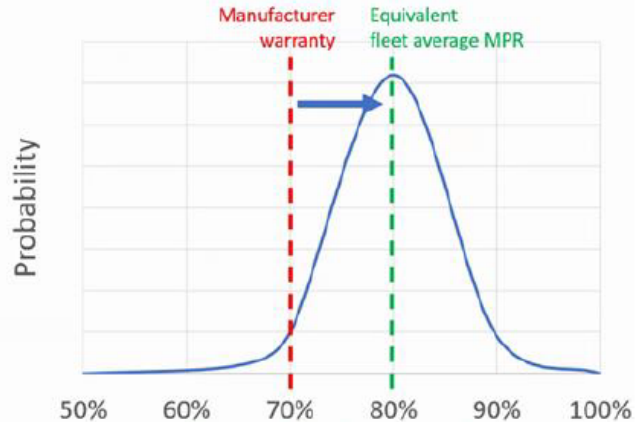
- N1 should be monitored only in Phase 1:**
- Not enough vehicles in the market
 - Not covered by TEMA or Geotab
 - No warranty data were presented

Explanation of the backstop concept with the following figures from EVE-40-02-Rev1e

NOTE: the concepts presented here are for discussion only, and values presented are only for illustration of the concepts.

Difference between warranty and MPR

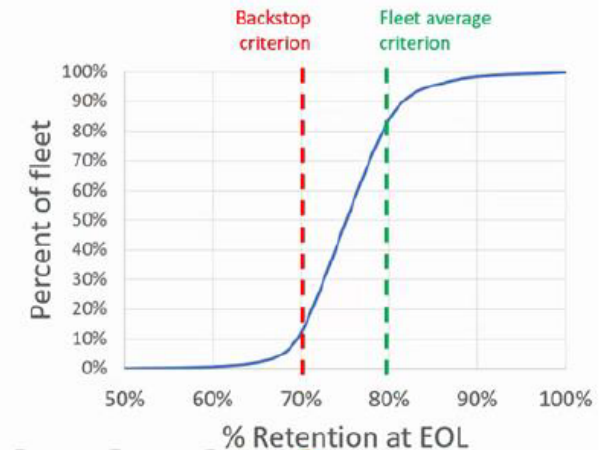
- MPR concept enforces a fleet average performance
- By contrast, manufacturer warranties enforce individual performance
- For a given performance curve in the field, the warranty level chosen by OEMs is therefore lower than the “equivalent” fleet average MPR



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Possible “backstop” concept for MPR structure

- MPR might consist of fleet average criterion + backstop criterion
- Both must be met. For example:
 - Fleet must average 80% retention
 - AND not more than 10% of fleet can achieve less than 70% retention



Key concerns from OICA:

- The shape of the curve is critical as at this stage, OEMs don't know the shape of the curve: Different regions, driving profiles, battery chemistry all play into the shape, etc.
 - TEMA model cannot be used for creating the shape of that curve as TEMA model still needs further evaluation
- ➔ Phase 1 with implemented SOCC and SOCR should be used to identify the distribution in the field and the shape of the curve

Reflections on Backstop concept and fleet average concept

- The MPR level verification in Part B was understood from the beginning as an average value („big picture“)
 - The environment is not interested in the single vehicle, the environment is interested in the big picture
 - Individual customers below the MPR could still be handled by provided manufacturer warranty
- Fleet average concept not requiring concept to exclude vehicles with abnormal usage and from extreme regions
 - Benefit: No vehicles selection process required (abnormal usage and extreme region vehicles compensated)
- Backstop concept is requiring a concept to exclude vehicles with abnormal usage and from extreme regions
 - Concern: No vehicle selection process is currently in place (means vehicles with extreme usage included)
 - With this boundary conditions, 95 % of the fleet should be better than the MPR

→ According to EVE leadership team, the MPR level should be even more stringent, if the fleet average would be applied

- The GTR development started just 12 month ago with this brand new topic
- Simulations and modeling are existing, representative market data are still missing
- In Phase 1 a lot of data will be collected, to set appropriate requirements for Phase 2
- The minimum performance requirements should not be overambitious at this stage as they should also cover the transformation of electrified mobility from early adopters towards a mass market

To stringent requirements, that were not even technically justified, would slow down the spread of electrification of mobility and will reduce the positive environmental impact of these vehicles