Arguments for range monitoring and base MPR + wide tolerance for UBE in Phase 1 of the GTR

EVE #39 meeting
04. November 2020
### Proposed contents for GTR Phase 1 and Phase 2

- **Phase 1**: UBE → base MPR + wide tolerances; range → monitoring

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>OVC-HEV</th>
<th>PEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range indicator</td>
<td>Monitoring_OVC-HEV*</td>
<td>Monitoring_PEV</td>
</tr>
</tbody>
</table>

*Note: Regarding "Monitoring_OVC-HEV": removed if no agreement is reached in Phase 1 for an appropriate range metric (AER, EAER, …)*

- **Phase 2**: UBE → advanced MPR + tighter tolerances; range → MPR + tolerances (based on monitoring)

<table>
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<tr>
<th>Phase 2</th>
<th>OVC-HEV</th>
<th>PEV</th>
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**Tolerances**
- Tolerance X (P1) >> Tolerance Y (P2); Tolerance range Z >>> Tolerance UBE Y

**MPR_base** = Base MPR to ban substandard products from the market

**MPR_adv** = Data driven MPR based on Phase 1 experience/learning (if needed)
Arguments for range monitoring in Phase 1

Argument 1 (for OVC-HEVs and PEVs):
- Range is influenced (also on dyno) on a lot more parameters than UBE (see presentation ACEA/Alliance: EVE-37-04-Rev2e.pdf)
- That higher influence from other parameters is requiring a higher tolerance for the indicator
- How much the higher tolerances need to be is hard to quantify

→ Range monitoring in Phase 1 can be used to get a broad data base for defining an appropriate tolerance for range indicator
→ Alternative to range monitoring: pretty conservative tolerances in Phase 1 which can be tightened anyway in Phase 2

Argument 2 (for OVC-HEVs and PEVs):
- Data from ACEA/Alliance in EVE-37 as well as from Japan in EVE-38 showed (currently) no influence of EC on range
- Therefore, as range is (currently) a function of decreased UBE, no urgency to set MPRs and tolerances for range already in Phase 1 (in Phase 1, that is sufficiently covered by tolerances and MPRs for UBE)

→ To respect the requests from legislator, range indicator will be kept but MPR and tolerances for range first in Phase 2
→ Range monitoring in Phase 1 can be used to get a broad data base for defining appropriate tolerances and MPRs for range indicator

Argument 3 (for OVC-HEVs):
- Range value for range indicator of OVC-HEVs is still in discussion (no decision yet; only feeling that EAER could work)
- Current results/findings on EAER look promising but further evaluation and scrutiny necessary
  - Is EAER really working under all circumstances? Is there any job stopper coming along?

→ Range monitoring gives more time to make this analysis and to avoid implementing something which does not work
→ At least for OVC-HEVs, this assessment is definitely required
OICA position regarding tolerance and MPR level:
- For UBE: base MPR and wide tolerance in Phase 1 (“rock-screening”), tighten tolerances and MPRs in Phase 2 based Phase 1
- For range: no MPR and tolerances defined in Phase 1; set MPR and tolerances in Phase 2 based on monitoring results

Argumentation for base MPR in Phase 1 for UBE:
- MPR level should be set in a way to ban substandard products from the market
- MPR level should not only base on simulation data from TEMA model and premium car vehicles (currently broad mass of EVs)
- MPR level (if too low) can be tightened anyway with the Phase 2

Argumentation for wide tolerances in Phase 1 for UBE:
- Tolerances should be wider as also with the UBE indicator some more experience need to be made
- Tolerances can be wider as they can be tightened anyway with Phase 2

Argumentation for shifting MPR and tolerances definition of range to Phase 2:
- Range value (especially for OVC-HEVs) needs more in-depth scrutiny and evaluation
- Critical point is for both OVC-HEVs and PEVs the definition of appropriate tolerance for the range indicator (Part A)
- Phase 1 can be used to find the appropriate tolerance and MPR level for range in Phase 2
- Industry understands concerns from legislator regarding range
  (although range degradation is currently no function of increased EC but just decreased UBE)
  → Industry accepts the range indicator but is asking for that monitoring phase as additional input for MPR and tolerance definition
Proposed timeline for GTR Phase 1 and Phase 2

### Development of GTR Phase 1

**Contents of GTR Phase 1**
- **UBE indicator:**
  - Part A: Verification with Tolerance X
  - Part B: MPR_base
- **Range Indicator**:  
  - Part A: Monitoring
  - Part B: Monitoring

*Note: Regarding „Monitoring_OVC-HEV“: removed if no agreement is reached in Phase 1 for an appropriate range metric (AER, EAER, …)*

### Implementation of GTR Phase 1 into regional legislation

Regional legislation (contents GTR Phase 1) in EU, US, JPN, etc.

**Technical lead-time required (indicator need to be implemented)**

**Other data sources**

### Development of GTR Phase 2

**Proposed contents of GTR Phase 2**
- **UBE indicator:**
  - Part A: Verification with tighter Tolerance Y (if necessary)
  - Part B: MPR_adv (replacing MPR_base if necessary)
- **Range Indicator:**
  - Part A: Verification with Tolerance Z
  - Part B: MPR_base

**Need for an appropriate starting time and length of the GTR Phase 2 development:**
Robust and wide data base is required for the indicator evaluation (indicator need be available + evaluation on broad basis of vehicle, especially aged vehicles)

**Data sources (e.g. data from OEM, TEMA, etc.)**
Overview: Customer information and regulator information

Information for the legislator

- Range *indicator* (cycle/procedure based)
  - Relevant for comparison with MPR
  - No information for the customer

Customer information

- UBE *indicator* (cycle/procedure based)
  - Relevant for comparison with MPR
  - Should be shown to the customer as important for second hand users

- Remaining battery range
  - (individual for each customer)
  - Not relevant for comparison with MPR
  - Will be shown in the HMI as important for knowing when to charge the vehicle