

# Interpolation family criteria

## OVC-HEV and NOVC-HEV (new proposal)

*In Discussion*

- a) Type of internal combustion engine: fuel type, combustion type, engine displacement, full-load characteristics, engine technology, and charging system shall be identical, but also other engine subsystems or characteristics that have a non-negligible influence on CO<sub>2</sub> and electric energy consumption under WLTP conditions;
- b) Operation strategy of all CO<sub>2</sub>-influencing components within the powertrain;
- c) Transmission type (e.g. manual, automatic, CVT);
- d) n/v ratios (engine rotational speed divided by vehicle speed). This requirement shall be considered fulfilled if, for all transmission ratios concerned, the difference with respect to the transmission ratios of the most commonly installed transmission type is within 8 per cent; → *unique description is necessary for CVT-HEV*
- e) Number of powered axles;

In addition above, the following specifications/characteristics shall be identical for NOVC-HEV and OVC-HEV.

- f) Type and amount of electric machines (UN R85: construction type (asynchronous/ synchronous / ...), kind of cooling (air, coolant, ...)) but also other characteristics that have a non-negligible influence on CO<sub>2</sub> and electric energy consumption under WLTP conditions;
- g) Type of traction battery (as described in UN R100/2: type, capacity, nominal voltage, nominal power, kind of cooling (water/air));
- h) Type of energy converter between electric machine and traction battery, between traction battery and low voltage power supply and between recharge-plug-in and traction battery but also other characteristics that have a non-negligible influence on CO<sub>2</sub> and electric energy consumption under WLTP conditions;

### Criteria for Charge Sustaining CO<sub>2</sub> range:

Vehicle\_L&H tests : whichever smaller 20g/km or 20% of Vehicle\_H

Vehicle\_L&M&H tests: within 30g/km

### Criteria for choosing vehicle M:

Regarding the choice of the mid vehicle a tolerance of plus/minus 10 percent of the energy demand from the virtual mid vehicle can be accepted. The choice of the vehicle shall be done with the approval of type approval authority.



Concerning Rcdc value (in case of OVC-HEV):

ACEA is working on a solution to exclude this point from the family criteria list

→ See BMW presentation (slide 18-27)



# Interpolation family criteria

## PEV(new proposal)

*In Discussion*

Unless vehicles are identical with respect to the following electric powertrain/electric machine/transmission characteristics, they shall not be considered to be part of the same vehicle family for PEVs:

- a. Type and amount of electric machines (UN R85) that have a non-negligible influence on electric energy consumption and range under WLTP conditions: construction type (asynchronous/ synchronous / ...), kind of cooling (air, coolant, ...); full-load characteristics
- b. Type of traction battery (as described in UN R100/2 type, capacity, nominal voltage, nominal power, kind of cooling (water/air));
- c. Transmission type (e.g. manual, automatic, CVT);
- d. Number of powered axles;
- e. Type of electric converter between electric machine and traction battery, between traction battery and low voltage power supply and between recharge-plug-in and traction battery that have a non-negligible influence on electric energy consumption and range under WLTP conditions: full-load characteristics, electric inverter technology
- f. Operation strategy of all components influencing the electric energy consumption within the powertrain;
- g. n/v ratios (engine rotational speed divided by vehicle speed). This requirement shall be considered fulfilled if, for all transmission ratios concerned, the difference with respect to the transmission ratios of the most commonly installed transmission type is within 8 per cent;