CLEPA observation on proposal to UNR154 04 series, Annex B10: Low-temperature test procedure for range determination of PEV

18th September 2025, London

PROPOSAL TO UNR154 04 SERIES, ANNEX B10

Low-temperature test procedure for range determination of PEV

Current UNR 154 04 series WD

Annex B10: Electric Range at Low Temperature

5.8.2.Transfer from soak to low temperature test cell

During the transfer, a stabilised vehicle shall not receive any unjustified exposures to temperatures outside the temperature tolerance -7 °C ± 3 °C. If that is unavoidable, the vehicle shall be stabilised before the start of the test procedure by keeping it at an ambient temperature of -7 °C ± 3 °C for at least six times as long as the vehicle was exposed to temperatures outside the temperature tolerance.

The transfer from the soak area to the test cell shall be undertaken as quickly as possible, without any unjustified delay with a maximum of 1 hour between charge completion end of soak and start of the test procedure.

CLEPA ask WLTP group for consideration of the proposed amendment

CLEPA proposal for a modified text

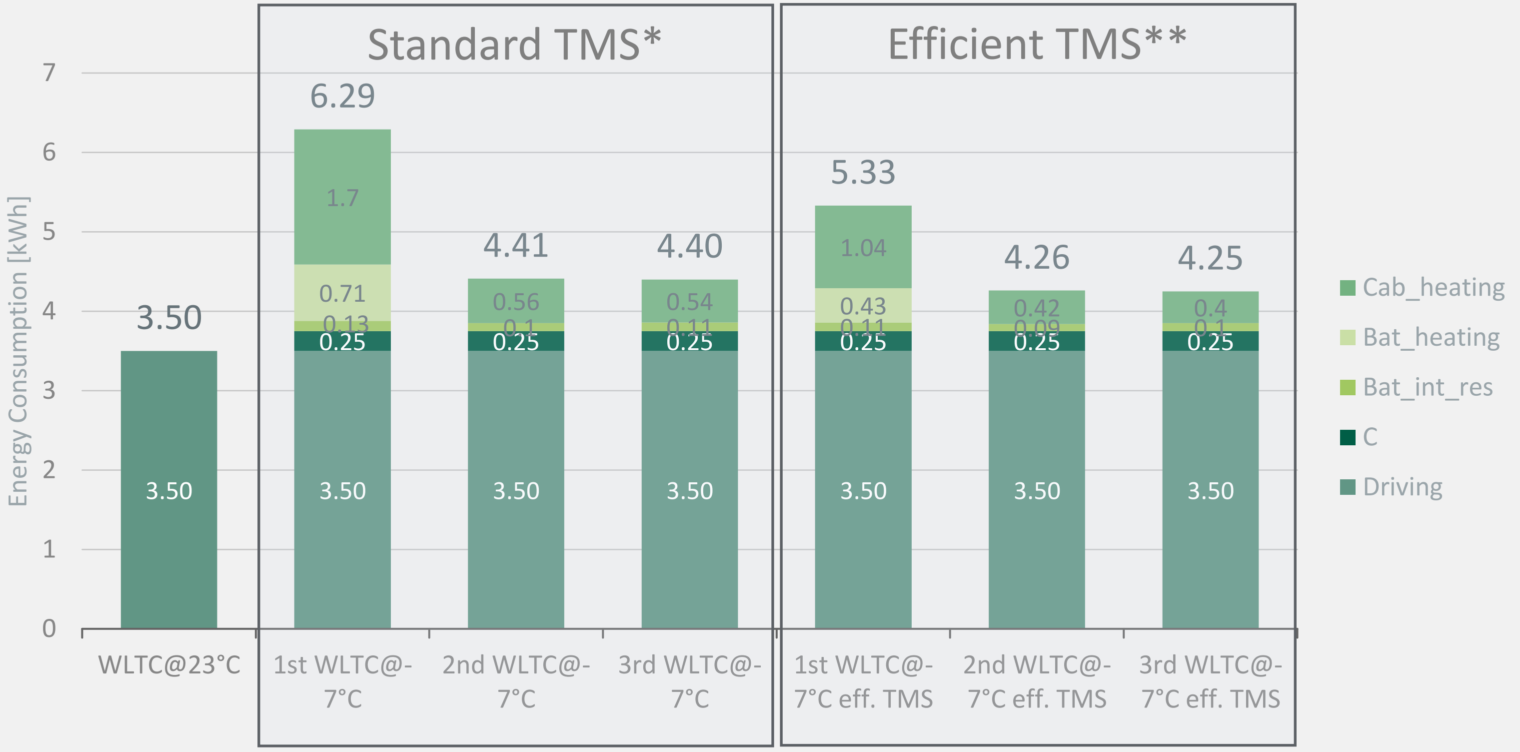
5.8.2.Transfer from soak to low temperature test cell

During the transfer, a stabilised vehicle shall not receive any unjustified exposures to temperatures outside the temperature tolerance -7 °C ± 3 °C. If that is unavoidable, the vehicle shall be stabilised before the start of the test procedure by keeping it at an ambient temperature of -7 °C ± 3 °C for at least six times as long as the vehicle was exposed to temperatures outside the temperature tolerance. **The battery internal temperature shall be checked to be within -7 °C ± 3 °C (i.e. by means of reading the information of the thermal sensor for the battery safety) before the test sequence for the PEV low temperature test procedure will start.**

The transfer from the soak area to the test cell shall be undertaken as quickly as possible, without any unjustified delay with a maximum of 1 hour between charge completion end of soak and start of the test procedure.

ENERGY BENEFIT OF AN EFFICIENT THERMAL MANAGEMENT SYSTEM (TMS)

- Encouraging Technological Progress



*Electrical heater for battery and cabin heating **Heat Pump for battery and cabin heating

An efficient TMS can provide more heating output for each unit of electrical energy it consumes

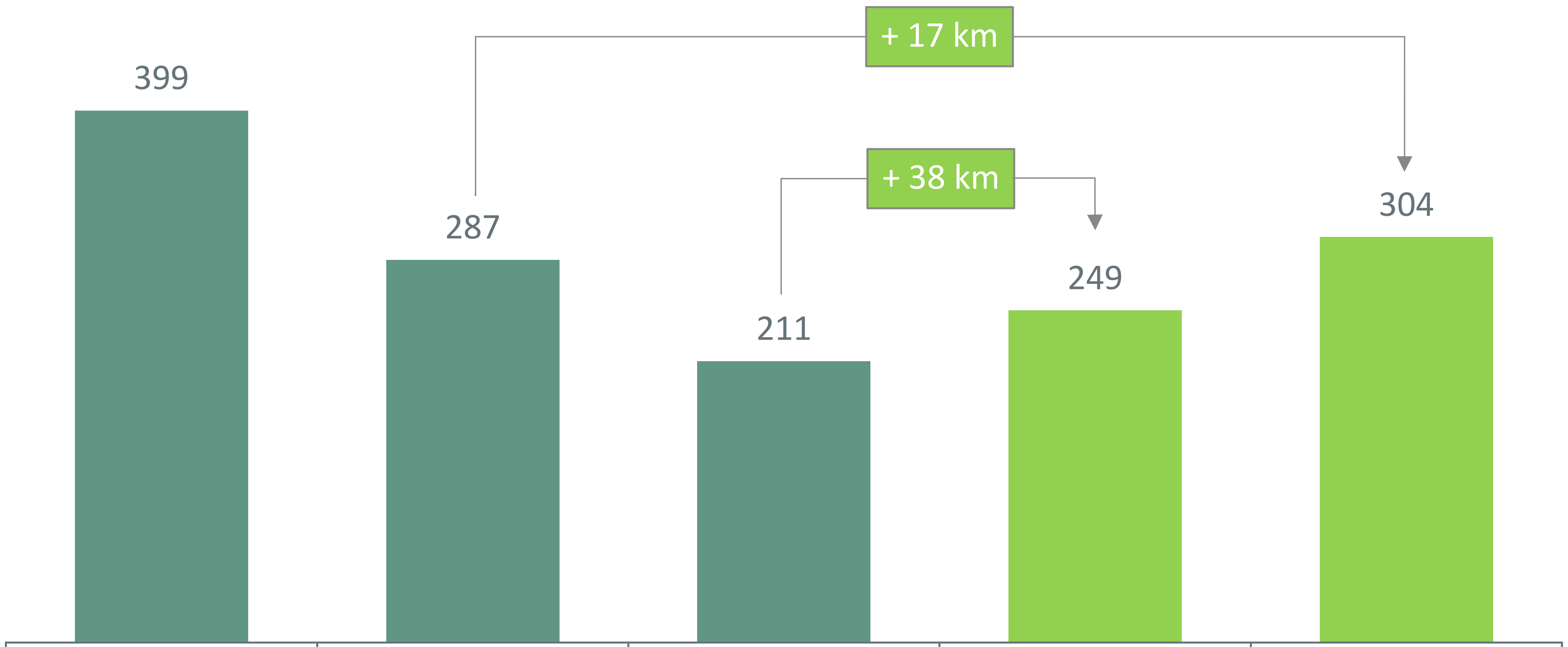
1. **Improves Efficiency in Cold**
   Efficient TMS (heat pump) are especially valuable in cold weather, where simple TMS using only electric-resistance cabin heaters can quickly drain the battery. A highly efficient TMS significantly reduces this energy drain by a factor ~1.5 average.
2. **Increases Driving Range**
   Since the efficient TMS use less battery energy to heat the cabin and battery, more energy is available for driving, resulting in longer range per charge.

An efficient TMS reduces energy consumption for climate control and battery, directly helping to extend the vehicle's driving range and improve overall energy efficiency.

REGULATION *AS DRAFTED* UNDERESTIMATES EFFICIENT SYSTEMS RANGE BENEFITS

Range including capacity reduction at cold conditions

in [km]



WLTC @23°C	Standard TMS, UNR154 04 WD	**Standard TMS Soaked First WLTC**	**Efficient TMS Soaked First WLTC**	Efficient TMS, UNR154 04 WD
UBE 60 kWh	UBE 57 kWh	UBE 57 kWh	UBE 57 kWh	UBE 57 kWh
No heating	Simple TMS	Simple TMS	Efficient TMS	Efficient TMS
Reference	-28%	-47%	-37%	-24%

Key Aspects

- End customers are misled about the actual range at cold temperatures.
- The range benefit of efficient systems is reduced to almost 50% by the current weighting.
- The current weighting favors inefficient systems and will slow down technological progress.

Efficient TMS are disadvantaged by the weighting.

PROPOSAL TO UNR154 04 SERIES, ANNEX B10

Low-temperature test procedure for range determination of PEV

Current UNR 154 04 series WD

Annex B10: Electric Range at Low Temperature

6. Calculations of electric range for pure electric vehicles.

6.1. Pure Electric Range (PER)

…

6.1.1. The pure electric range for the applicable WLTP test cycle $PER_{WLTC@LowTemp}$ for PEVs shall be calculated from the PEV low temperature test procedure as described in paragraphs 5.9.4. to 5.9.7. of this annex using the following equations:

$$PER_{(WLTC@LowTemp)}=UBE_{(@LowTemp)}/EC_{(DC,WLTC@LowTemp)}$$

…

$$EC_{DC,WLTC@LowTemp} = \sum_{j=1}^{n_{WLTC}} EC_{DC,WLTC,j} \text{ x } K_{WLTC,j}$$

$$K_{WLTC,1} = \frac{\Delta E_{REESS,WLTC,1}}{UBE_{@LowTemp}} \; ; \; K_{WLTC,j} = \frac{1-K_{WLTC.1}}{n_{WLTC}-1} \text{ for } j = 2 \ldots n_{WLTC}$$

CLEPA proposal for a modified text

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6.1. Pure Electric Range (PER)

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6.1.1. The pure electric range for the applicable WLTP test cycle $PER_{WLTC@LowTemp}$ for PEVs shall be calculated from the PEV low temperature test procedure as described in paragraphs 5.9.4. to 5.9.7. of this annex using the following equations:

$$PER_{(WLTC@LowTemp)}=UBE_{(@LowTemp)}/EC_{(DC,WLTC@LowTemp)}$$

For the PEV low temperature **min. range** determination:

$$EC_{DC,WLTC@LowTemp} = EC_{DC,WLTC,1} \text{ x } K_{WLTC,1} \; ; \; K_{WLTC,1} = 1$$

For the PEV low temperature **max. range** determination:

$$EC_{DC,WLTC@LowTemp} = \sum_{j=1}^{n_{WLTC}} EC_{DC,WLTC,j} \text{ x } K_{WLTC,j}$$

- $K_{WLTC,1} = \frac{\Delta E_{REESS,WLTC,1}}{UBE_{@LowTemp}}$;
- $K_{WLTC,1} = \frac{\Delta E_{REESS,WLTC,1}}{UBE_{@LowTemp}}$; $K_{WLTC,2} = 1 - K1$; n=2
- $K_{WLTC,3} = 1 - K_{WLTC.1} - K_{WLTC,2}$; for $n = 3$
- $K_{WLTC,1} = \frac{\Delta E_{REESS,WLTC,1}}{UBE_{@LowTemp}}$; $K_{WLTC,2} = \frac{\Delta E_{REESS,WLTC,2}}{UBE_{@LowTemp}}$;

(Proposal from JRC)

CLEPA ask WLTP group for consideration of the proposed amendment

European Association of Automotive Suppliers

Thank you!

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