Japan Proposal on Discussion Points for Low Temp. TF

13th & 14th March

Discussion Points for Low Temp. TF (1/2)

☐ **Bold**: **Discussion Points** / non-Bold: Ideas to discuss (not JPN position)

Vehicle category / sequences		ICE	NOVC-HEV OVC-HEV(CS)	NOVC-FCHV OVC-FCHV(CS)	OVC-HEV （CD）	OVC-FCHV(CD)	PEV
Vehicle setting		same setting as 23℃					
Test conditions	**Test mass**	same setting as 23℃					
	R/L	【apply compensation factor per ambient temperature】 1：same as R83、2：air density only，3：others 【apply compensation factor per altitude】 1：air density only、2：others 【apply compensation factor per auxiliary devices】 1：in operation during test (switch position need to be defined) 、2：increase R/L (how much?)					
R/L derivation	**coast down test**	practically impossible to measure R/L under the specific conditions （compensate R/L under standard conditions)					
	Dyno. setting	1：conduct R/L set under specific conditions 2：conpensate dynamometer set value @23℃					
Pre-setting	**REESS**	NA			need to stabilize REESS temperature *		
Pre-conditioning	**Test environment**	【Temp】1. allow @ 23℃, 2. mandate @ specific temp. 【Altitude】mandate @ specific altitude (stabilize emission control strategy)					
Soak	**Soak environment**	【Temp】mandate @ specific temp. (allow forced cool down ?) 【Altitude】allow @ see level					
	duration	1. check engine coolant & oil temp (except FCHV and PEV) 2. duration check only					
	REESS charge	NA			same condition as vehicle soak how to ensure the REESS temperature including warm-up strategy *		

*) please refer appendix

Discussion Points for Low Temp. TF   (2/2)

❑ **Bold**: **Discussion Points** / non-Bold: Ideas to discuss (not JPN position)

Vehicle category / sequences		ICE	NOVC-HEV OVC-HEV(CS)	NOVC-FCHV OVC-FCHV(CS)	OVC-HEV （CD）	OVC-FCHV(CD)	PEV
Testing	**cycle**	harmonized cycle (L + M + H)					harmonized cycle (allow shorten procedure)
	HVAC	operation* (setting of manual : start operation at XX sec with maximum @ hot max position, then change to minimum at YY sec)					
	REESS charge	NA			same condition as vehicle soak how to ensure the REESS temperature including warm-up strategy *		
Data processing	**DF （deterioration factor)**	Pollutants : same as R83 (no DF is applied) CO2/FC/Range/EC : apply same logic as 23℃ scenario (under the discussion)					
	SOC factor	NA	allow use same factor derived @23℃. As an option, accept specific factor derived @ specific temp.		NA		
	UF				use same UF as defined in gtr		NA

Discussion Points for
# Electric Range of Electrified Vehicles

(Appendix)

REESS Capacity Change depending on REESS Temp.

❑ As the REESS temperature decreases, the internal resistance increases.
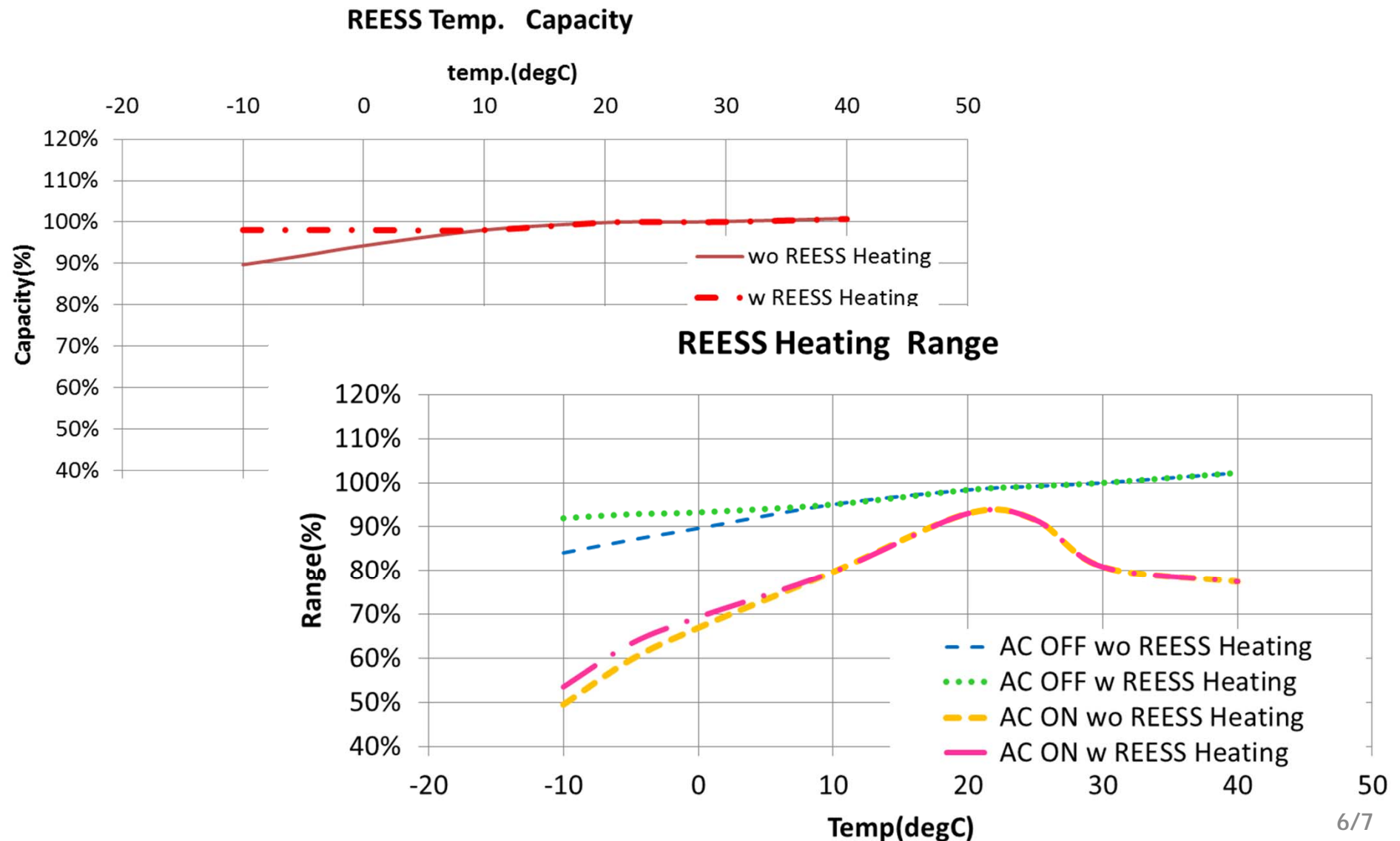   → The REESS capacity & the power output will decrease

REESS Temp. Capacity
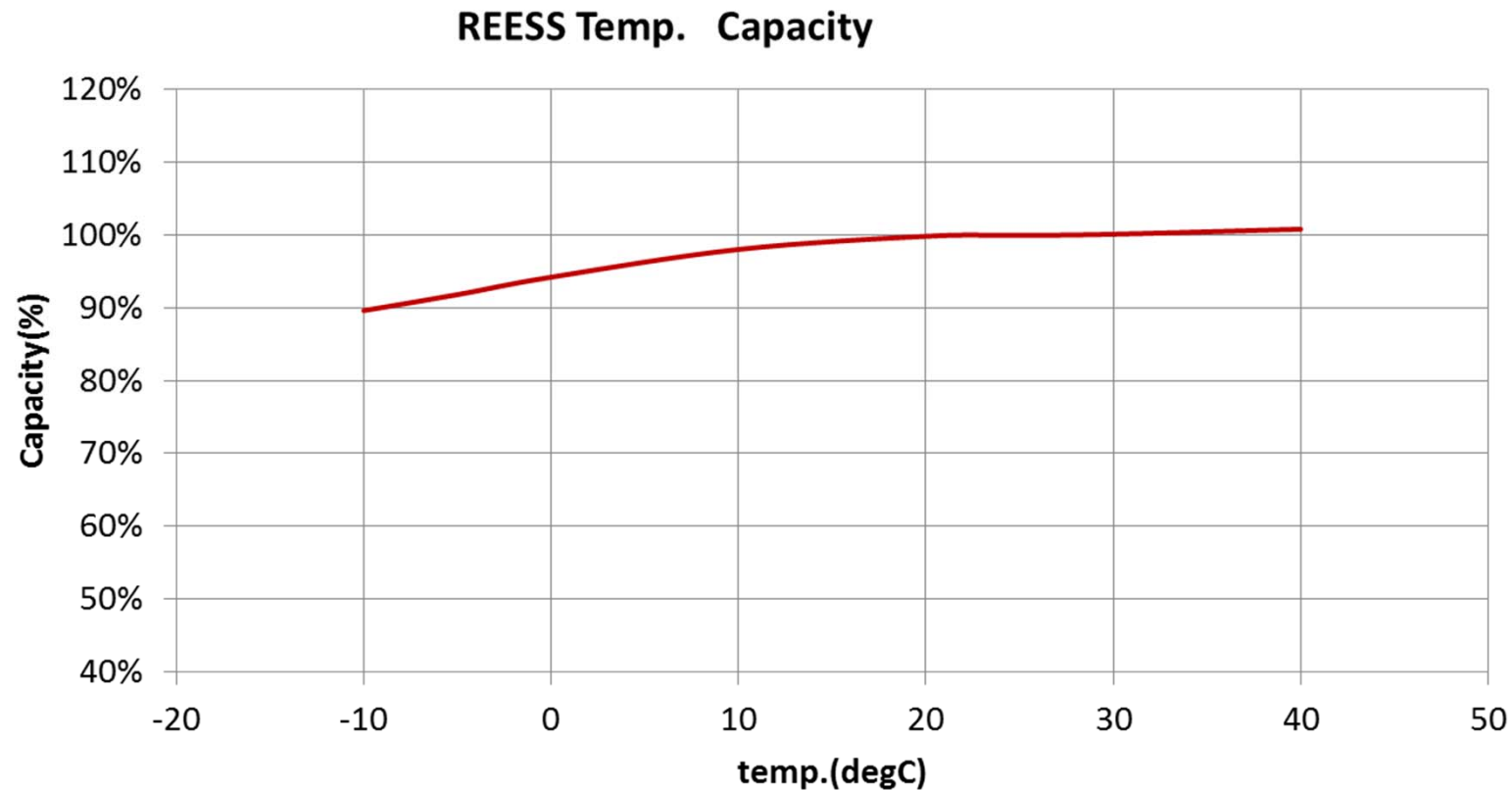
Electric Range depending on AC system ON/OFF

❑ Cabin AC system have a huge impact on the electric range

REESS Temp. Electric range
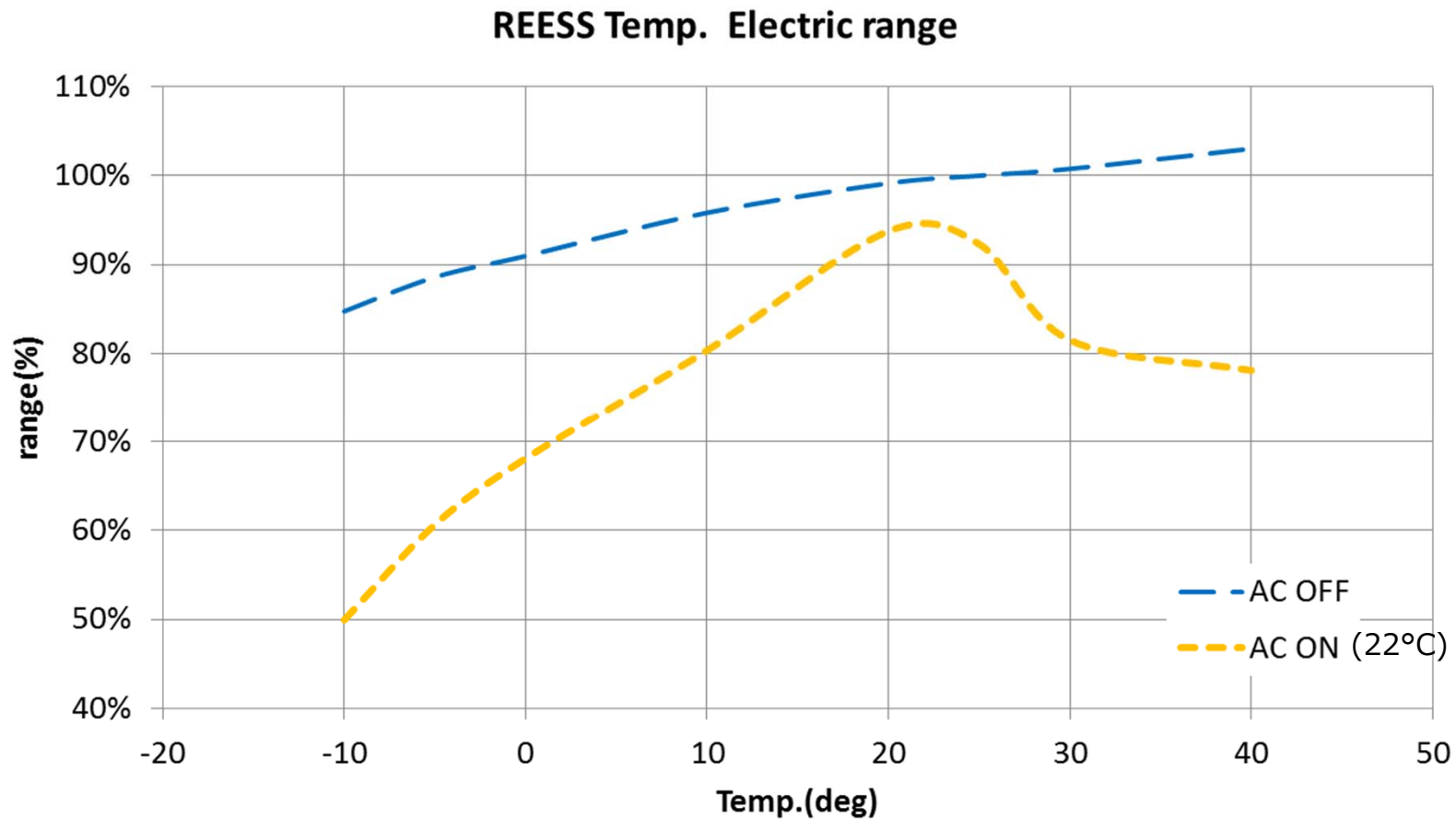
Capacity & Electric Range depending on REESS Heating

❑ REESS Capacity & Electric Range are effected by REESS Heating

REESS Temp. Capacity

temp.(degC)

- wo REESS Heating
- • w REESS Heating

REESS Heating Range

- AC OFF wo REESS Heating
- AC OFF w REESS Heating
- AC ON wo REESS Heating
- AC ON w REESS Heating

Temp(degC)

Discussion Points for Electric Range at Low Temp.

❑ Evaluation of shortened electric range due to REESS capacity and power decrease at low temperature

❑ Evaluation of shortened electric range due to AC system (heater) ON which cause more electric consumption

❑ Evaluation of REESS heating contribution to range, and other state-of-art technologies

Need to consider a procedure to evaluate state-of-art technologies on fair basis at Low & Realistic winter Temperature