

# Japan Proposal on Discussion Points for Low Temp. TF

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13<sup>th</sup> & 14<sup>th</sup> March

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

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

Vehicle category		ICE	NOVC-HEV OVC-HEV(CS)	NOVC-FCHV OVC-FCHV(CS)	OVC-HEV (CD)	OVC- FCHV(CD)	PEV
<b>sequences</b>							
<b>Vehicle setting</b>		same setting as 23°C					
<b>Test conditions</b>	<b>Test mass</b>	same setting as 23°C					
	<b>R/L</b>	[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?)					
<b>R/L derivation</b>	<b>coast down test</b>	practically impossible to measure R/L under the specific conditions (compensate R/L under standard conditions)					
	<b>Dyno. setting</b>	1 : conduct R/L set under specific conditions 2 : compensate dynamometer set value @23°C					
<b>Pre-setting</b>	<b>REESS</b>	NA			need to stabilize REESS temperature *		
<b>Pre-conditioning</b>	<b>Test environment</b>	[Temp]1. allow @ 23°C, 2. mandate @ specific temp. [Altitude] mandate @ specific altitude (stabilize emission control strategy)					
<b>Soak</b>	<b>Soak environment</b>	[Temp] mandate @ specific temp. (allow forced cool down ?) [Altitude] allow @ see level					
	<b>duration</b>	1. check engine coolant & oil temp (except FCHV and PEV) 2. duration check only					
	<b>REESS charge</b>	NA			same condition as vehicle soak how to ensure the REESS temperature including warm-up strategy *		

\*) please refer appendix 1/7

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

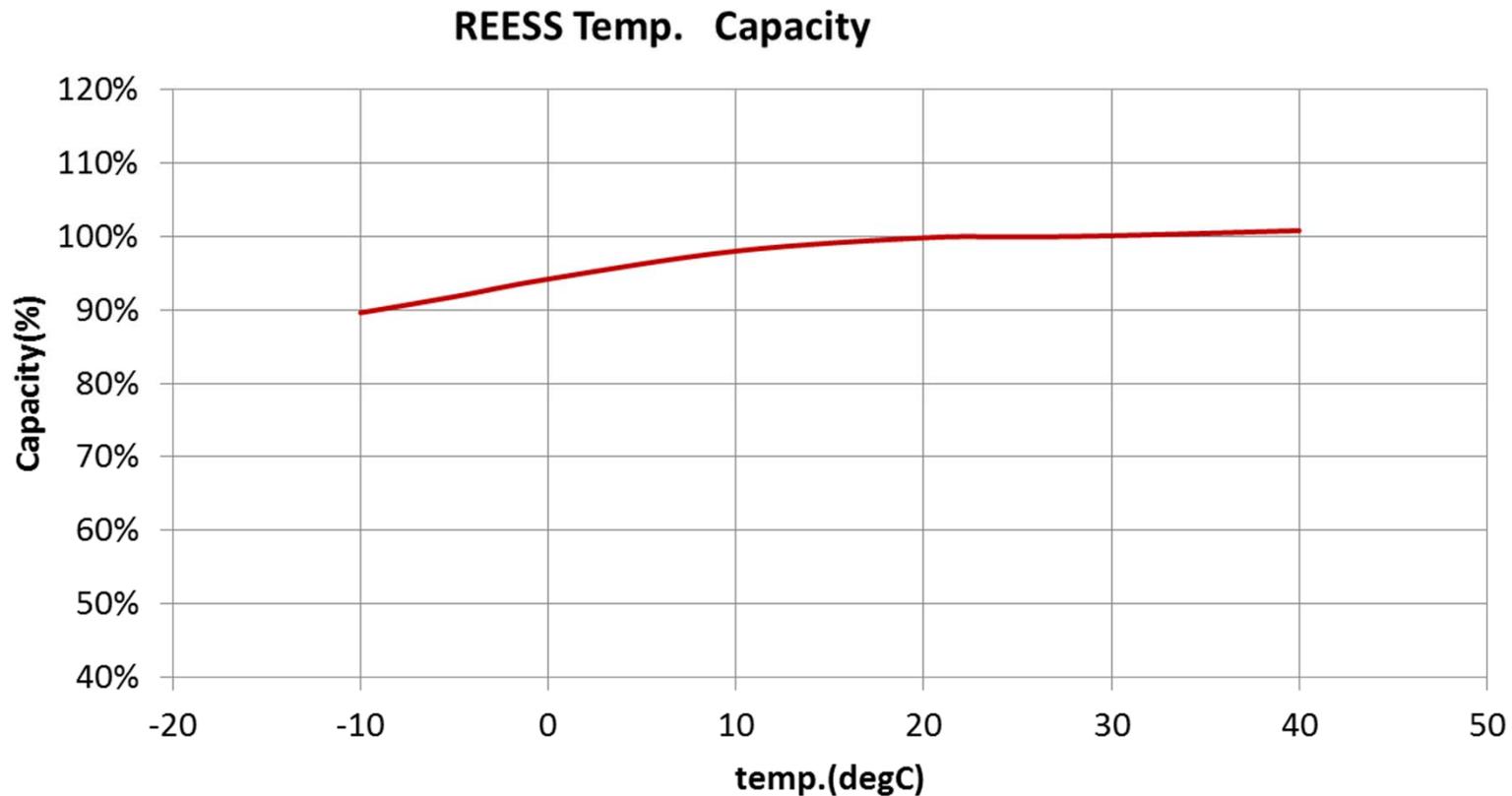
# Discussion Points for Electric Range of Electrified Vehicles

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(Appendix)

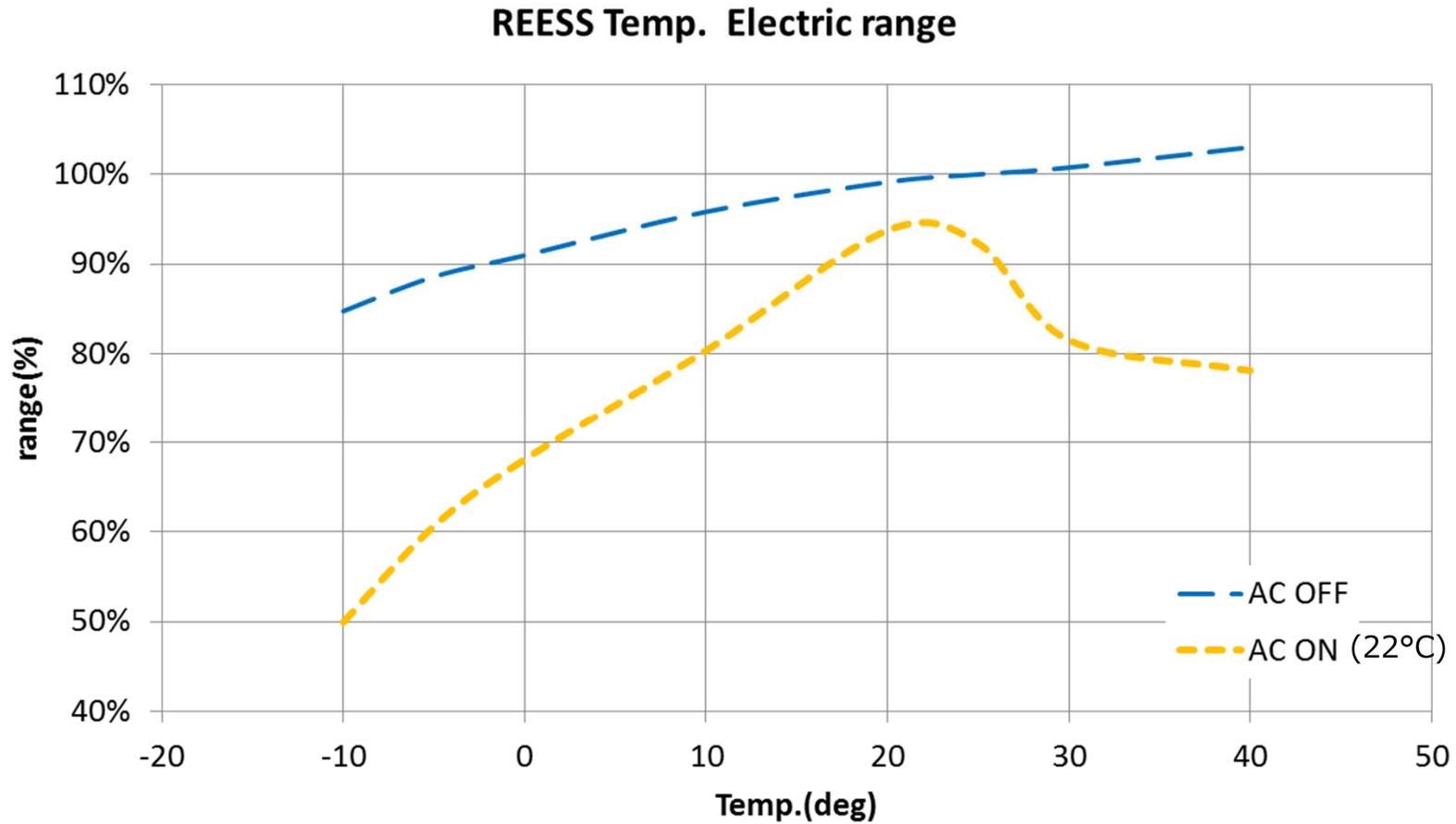
# REESS Capacity Change depending on REESS Temp.

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



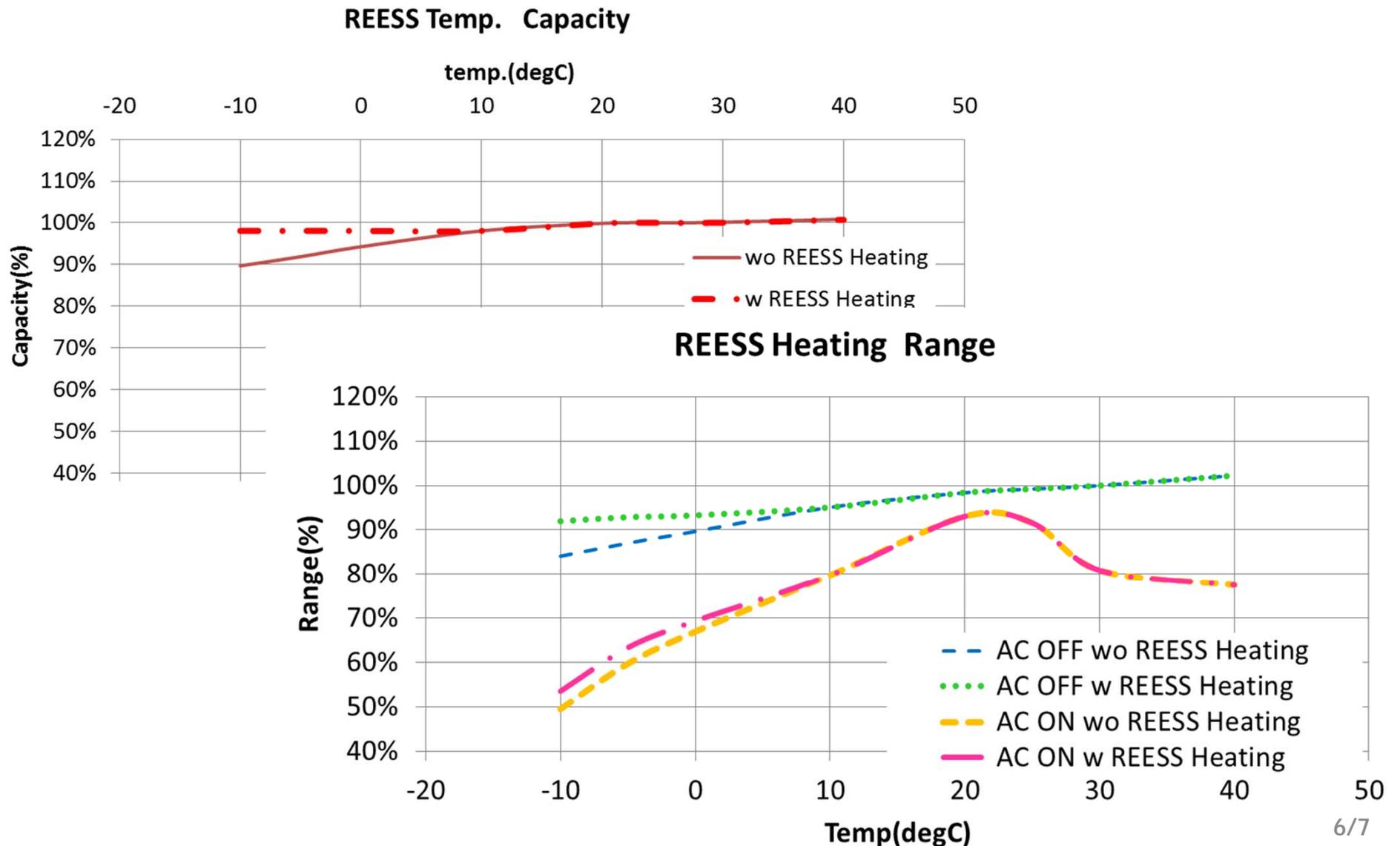
# Electric Range depending on AC system ON/OFF

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



# Capacity & Electric Range depending on REESS Heating

- REESS Capacity & Electric Range are effected by REESS Heating



## Discussion Points for Electric Range at Low Temp.

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- ❑ 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