

WLTP-E-Lab Sub Group Progress report

WLTP-DTP-E-LabProc-066

Leader: Per Ohlund / Kazuki Kobayashi

State of E-lab sub group activity from DTP #9 in April

1.gtr draft study (to be reported by drafting coordinator)

2.Preparation for Validation Phase 2

Test matrix:ACEA-LabProc-EV-TestMatrix_VP2_08052012

Test guidance:WLTP-DTP-E-LabProc-065_Parameter_for_Validation2_V2.ppt

Open issues

Green	Agreed or Deleted	18
Yellow	Validation test (or after VP2)	16
Blue	Proposed	2
White	Open Issues	17

Color means state of each issue on Open issue list

17 open Issues are

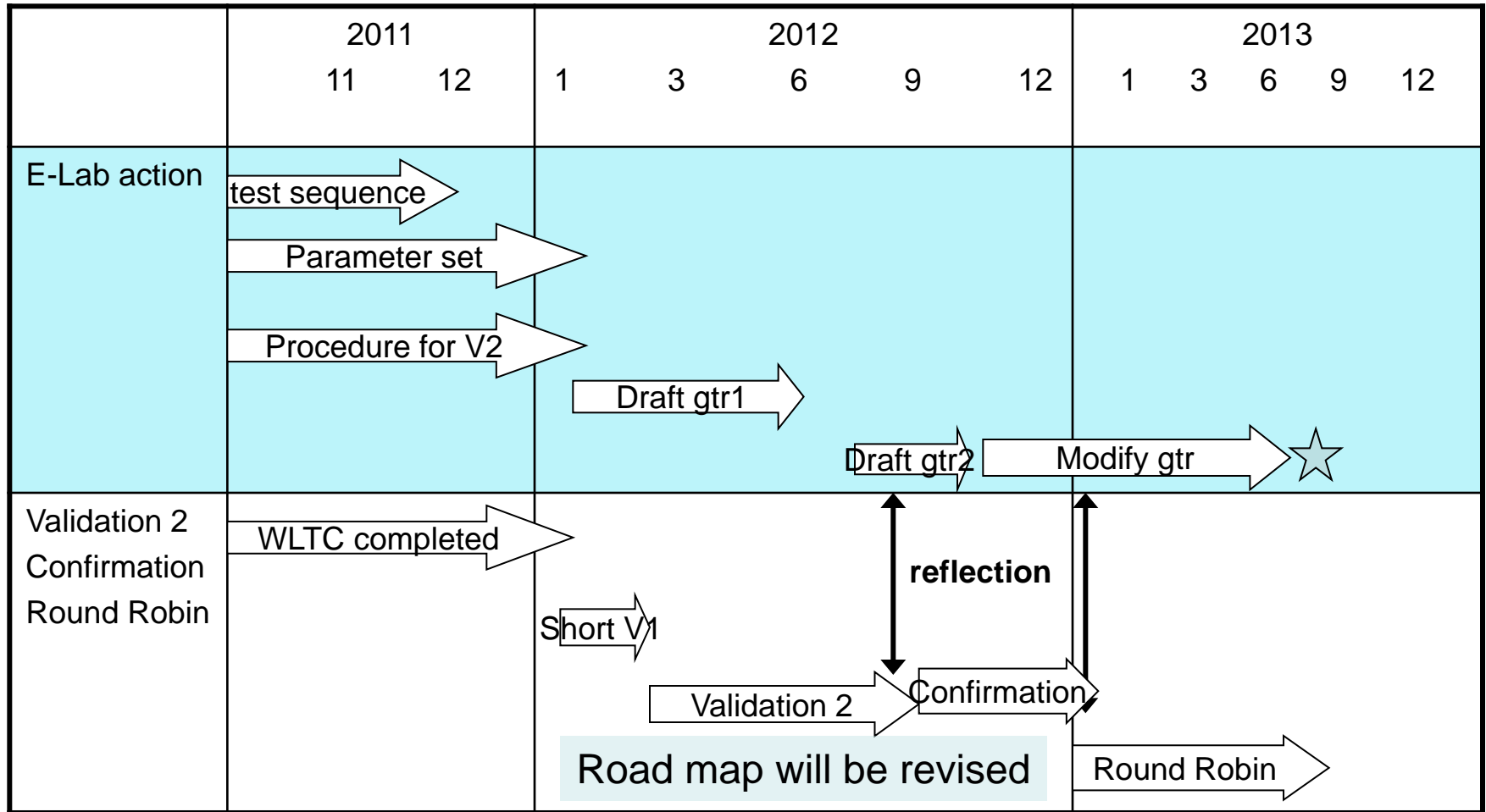
To be discussed 2 (UF, Battery charging time) =>To be discussed during V2

Depends on new cycle 1 (AE city for Low speed EV) => To be discussed during V2

Depends on Validation results 5 (ex,EV range, CD /CS test,)=>TBD after V2

Follow ICE group 3 (R/L, multi gear box, Runin mileage)

Proposed actions for gtr development



[Background]

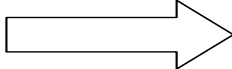
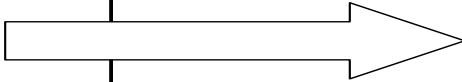
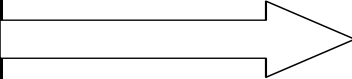
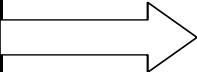

1. Draft gtr 1 is the portion exclude Validation phase 2.
2. Some of open issues need to be evaluated during the validation program.
3. Draft gtr 2 is reflected the result of Validation 2 .

Preparation Validation Phase2 in JAPAN

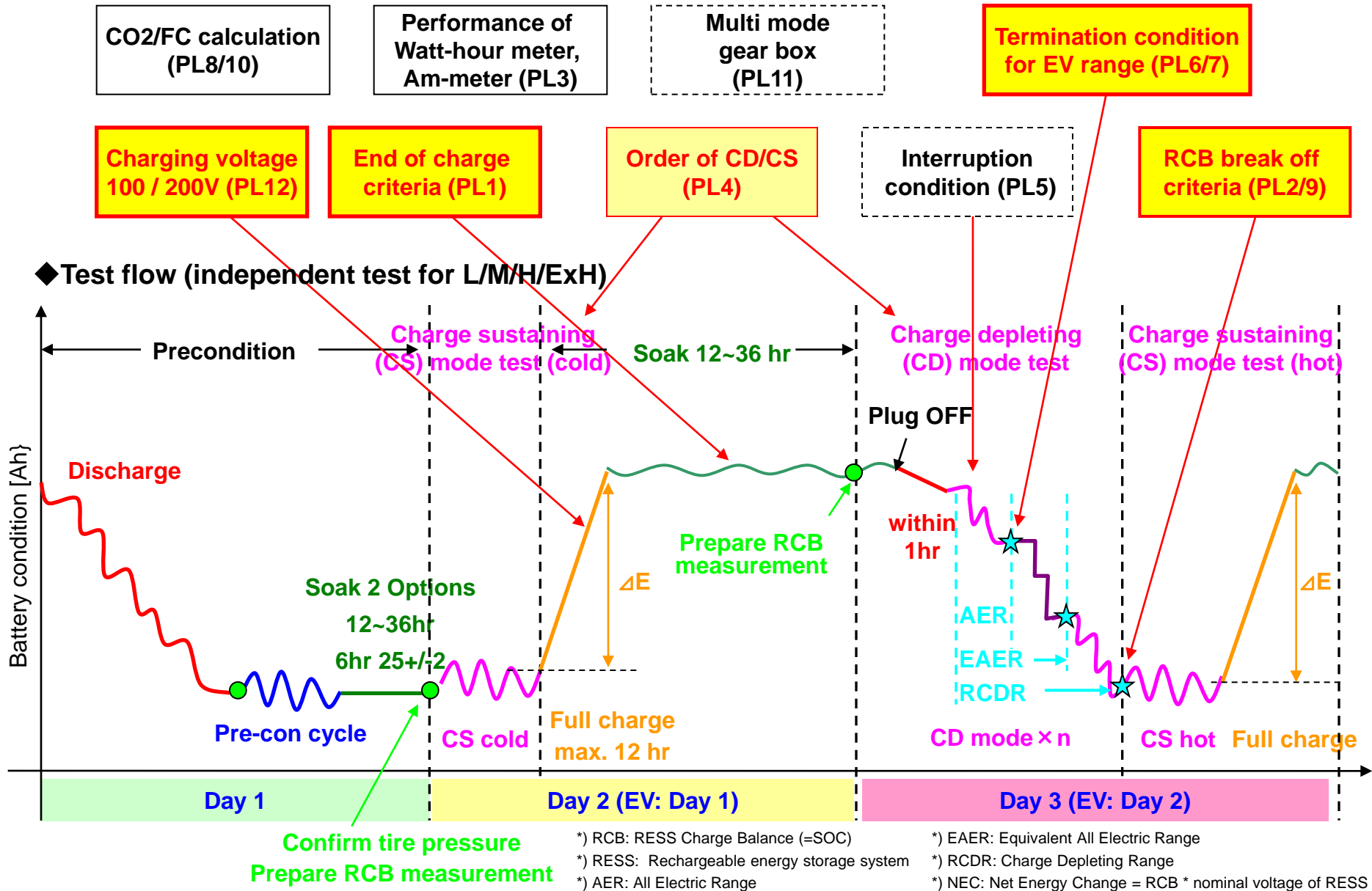
Test vehicles

Vehicle type		OVC-HEV	NOVC-HEV	BEV
brand/type		Toyota Prius PlugIn	Toyota Prius	Mitsubishi i-Miev
Location		Japan(NTSEL)	Japan(NTSEL)	Japan(NTSEL)
Vehicle weight		1420kg	←	1100kg
ICE	displacement	1.797L		
	Power	73kw		
	Torque	142Nm		
Moter	Power	18kw	←	47kW
	Torque	207Nm		180Nm
Driving Battery	Battery type	litium-ion	←	Litium-ion cell
	voltage	207.2V		330V
	Battery capacity	4.4kwh		16kwh

Schedule

	June	July	Aug	Sep
Preparation				
Validation				
Analyzing data				
Report				 

Consideration items on E-Lab. Gr.



*) RCB: RESS Charge Balance (=SOC)

*) RESS: Rechargeable energy storage system

*) AER: All Electric Range

*) EAER: Equivalent All Electric Range

*) RCDR: Charge Depleting Range

*) NEC: Net Energy Change = RCB * nominal voltage of RESS

OVC – HEV Number of test

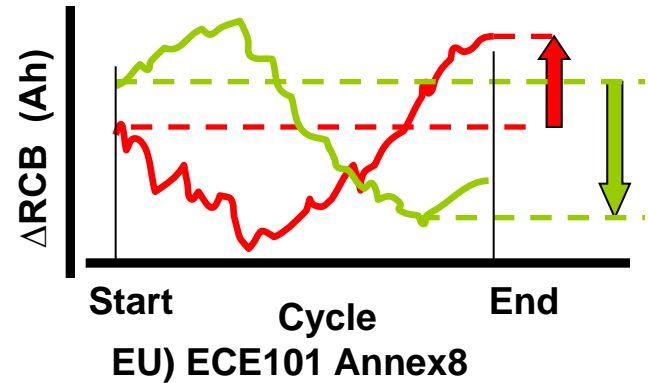
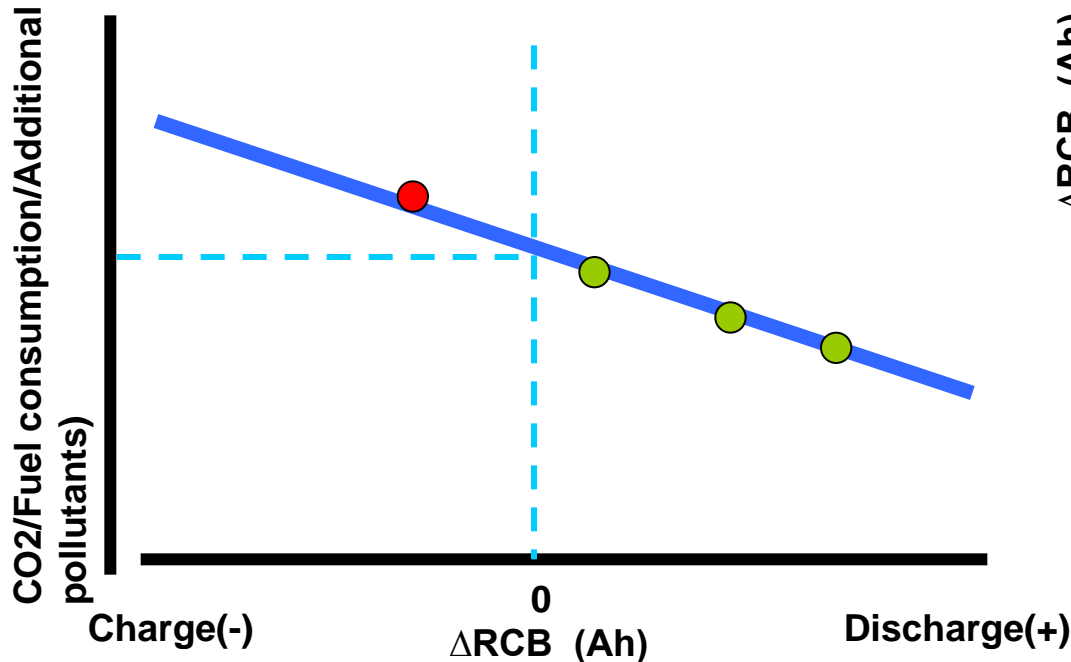
No	evaluated parameter	procedure	number of test (minimum)
1	Each phase(L,M,H,ex-H) and WLTC total phase for CD→CS test	To compare each phase and WLTC total phase regarding CD range, pollutants , energy consumption and so on.	CD→CS test 5times
2	CD→CS break off criteria	To be evaluated during No1 test	↑
3	Soak time between each phase gtr draft:10 minutes	To evaluate how long does it take to analyze sampling bag during soak time.	↑
4	The time from charge completed to start the test gtr draft :30 minutes	To evaluate(depends on each laboratory)	↑
5	RCB fluctuation during charging	To measure voltage and ampere	↑
6	Soak condition comparison	(a)6hr Water/Oil temp 25+/-2degC with cooling fan (b)12-36hr	above +1time
7	Order of test (CD,CS)	To compare the impact CD → CS and CS→CD	above +1time

※No.7: Impossible to conduct due to a lot of tests

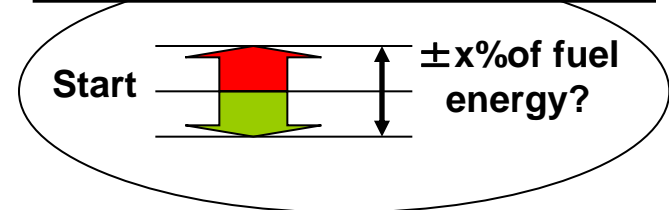
NOVC – HEV Number of test

No	evaluated parameter	procedure	number of test (minimum)
1	RCB vs AP	To evaluate the correlation between RCB and AP by conducting CS test	Each phase and total WLTC 5times
2	RCB correction criteria	To evaluate CS test with several RCB condition	↑

Appendix: RCB Compensation



OIL No.27 RCB correction criteria



BEV Number of test

No	evaluated parameter	procedure	number of test (minimum)
1	L,M,H,ex-H The impact for EV range	To compare each phase and WLTC total phase regarding EV range	Each phase and total WLTC 5times EV range test
2	Interruption condition during EV range test(for the driver)	3minutes between each driving cycle(total 15 minutes)	↑
3	Termination condition for EV range test	To evaluate until vehicle stop completely	↑
4	The time from charge completed to start the test gtr draft :30 minutes	To evaluate(depends on each laboratory)	↑
5	RCB fluctuation during charging	To measure voltage and ampere	↑
6	Soak condition comparison	(a)6hr Water/Oil temp 25+/-2degC with cooling fan (b)12-36hr	above +1time
7	AER city (L+M)	To evaluate AER city range	above +1time

※No.7: Impossible to conduct due to a lot of tests

Appendix : Open issues

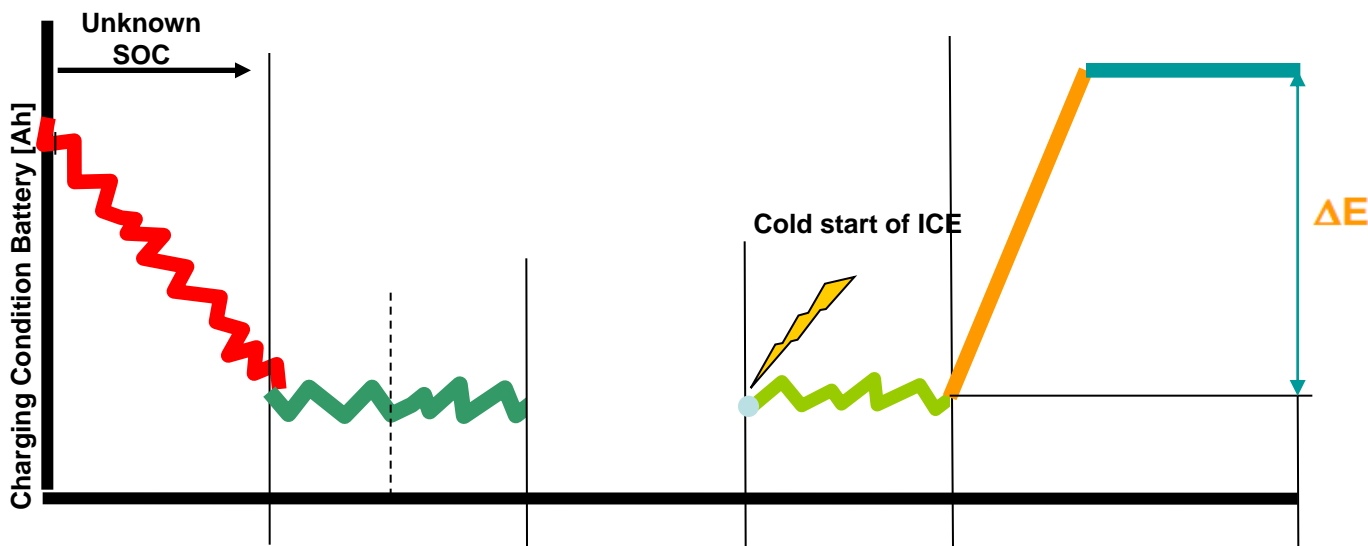
- Green color means “agreed or deleted”
- White color means “to be discussed “.
- Yellow color means “ to be evaluated in Validation phase 2”.
- Blue color means “proposed”.

Proposal

Step 3 Charge Sustaining Mode

Performance of
Watt-hour meter,
Am-meter

OIL
No.15,16,17

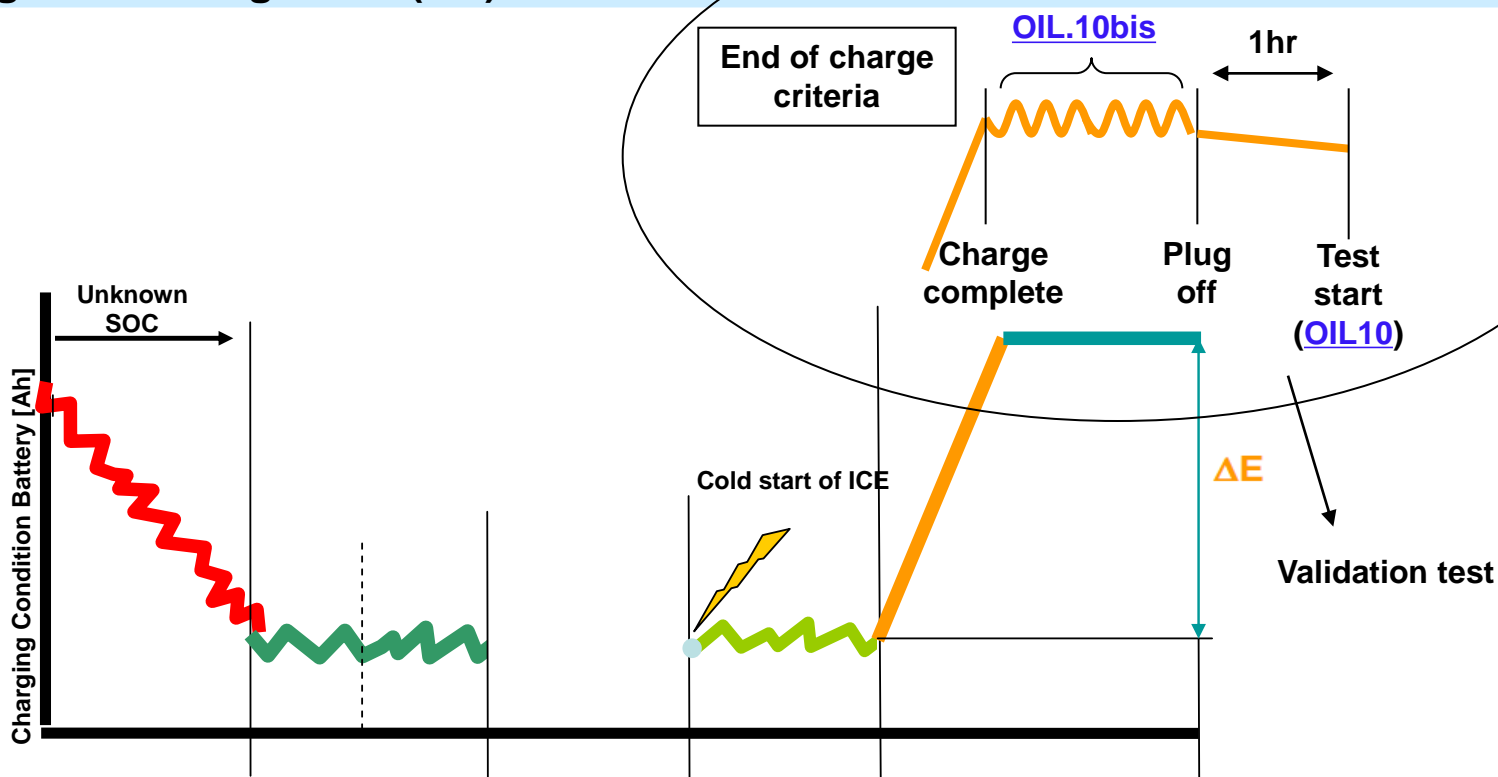


	operation switch	initial discharge	pre-conditioning	Soak time	Charge sustaining test	Charging OIL No.8 Charging method
EV	n/a	n/a	n/a	n/a	n/a	Consumption test OIL No.2
OVC HEV	without	<u>OIL No.14</u> discharge condition MR	follow ICE	follow ICE	OIL No.26,27 RCB correction	Charging time: OIL No.9 Condition: OIL No.7 end of charge : OIL No.10,10bis
	With					
NOVC HEV	Without	n/a	follow ICE	follow ICE	Ex; correct emission?	n/a
	with					
	with					

Validation test

Proposal

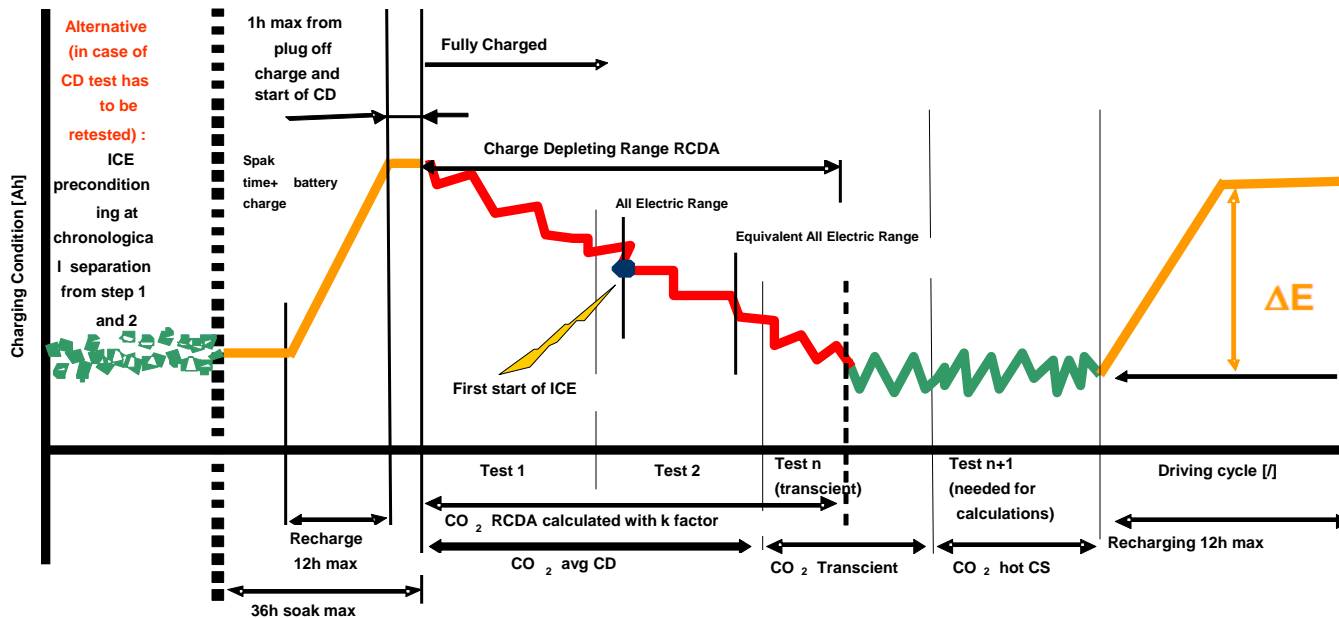
Step 3 Charge Sustaining Mode (bis)



	operation switch	initial discharge	pre-conditioning	Soak time	Charge sustaining test	Charging
EV	n/a	n/a	n/a	n/a	n/a	
OVC HEV	without	OIL No.14 discharge condition	follow ICE	follow ICE	OIL No.26,27 RCB correction	Charging time: OIL No.9 Condition: OIL No.7 end of charge :OIL No.10,10bis
	With					
NOVC HEV	Without	n/a	follow ICE	follow ICE	Ex; correct emission?	n/a
	with					
	with					

Proposal

Step4 Charge Depleting Mode



	operation switch	charging after CS test	Charge depleting test/EV range test OILNo.11 Interruption Condition	Charging
EV	n/a	n/a	Test termination Condition OIL No.12 Stop Condition OILNo.13	<p>OIL.No31 Low power vehicle</p> <p>What is Low power vehicle? How to validate?</p> <p>To be raised DTP level</p>
OVC HEV	without	refer to step3	RCB break off criteria: OIL No.25 & 25bis Deceleration condition; OIL No.13bis EAER determination OIL No.21 To be discussed based on validation result.	
	with			
NOVC HEV	without	n/a	n/a	
	with			
	with			

Proposal

Step5: Calculation

Detailed calculation formula is developed based on validation test results.

Pollutants :

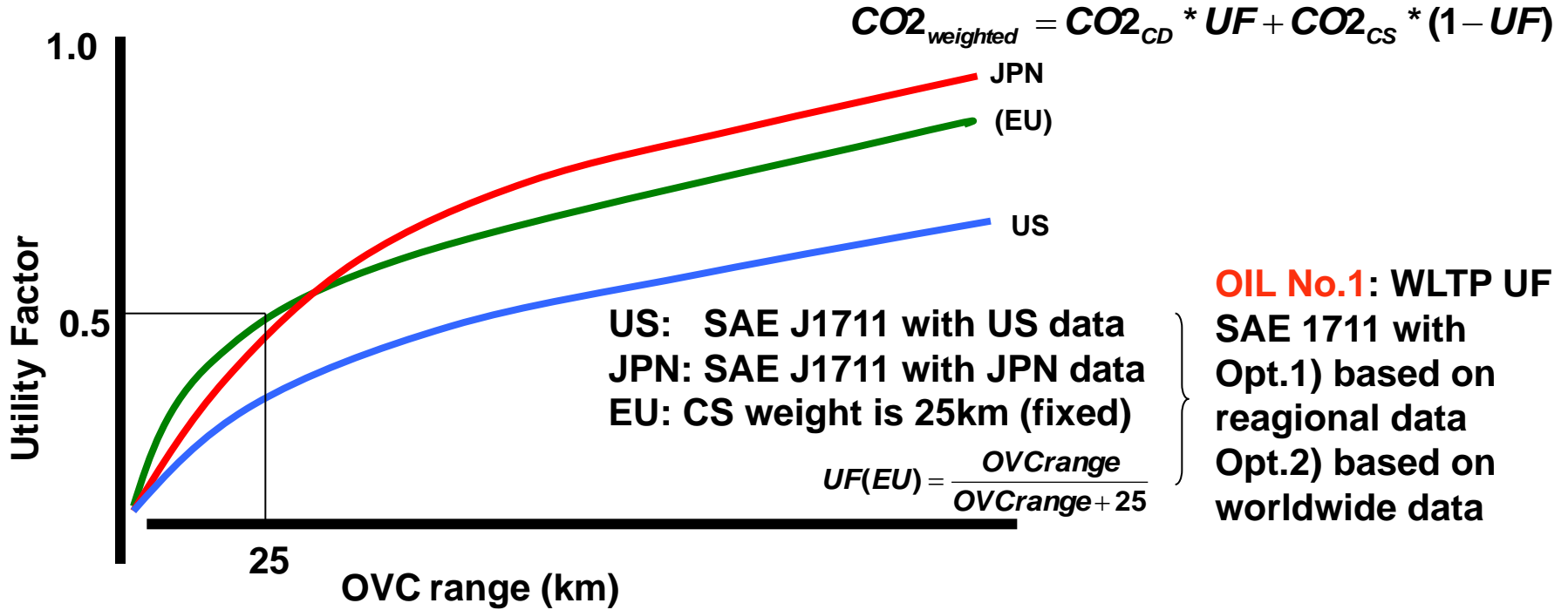
CO2/Fuel Consumption :

Range :

	Operation switch	Pollutants	Fuel Consumption	Electric Energy	Range					RCB(DC)	Chaege Duration	others	
					AER	EAER	Rcda	Rcdc	AERcity				
EV	n/a	n/a	n/a	applicable	applicable	n/a					Applicable		
OVC HEV	Without	applicable	applicable	Applicable	Applicable								
	With												
	With												
NOVC HEV	Without	applicable	applicable	n/a									
	With												
	With												

Proposal

Appendix: Utility Factor



	Operation switch	Utility Factor
EV	Without	
OVC HEV	With (incl. pure EV)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">To be discussed later stage</div>
	With (no pure EV)	
	Without	
NOVC HEV	With (incl. pure EV)	n/a
	With (no pure EV)	
	Without	

Political issue what should be discussed in DTP meeting.

Annex: Open issue list 1

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion	gtr text	VP2
1	political/tec	OI	Utility factor	The us and jp regulation has methods which include statistical analysis. (EU:25km)	These methods will be considered. SAE method is acceptable. But to get the traffic data of all country is too difficult. Result of Stockholm meeting. The formula to calculate CO2 is agreed. How to determine UF is still open issue.	OVC(PHEV)	1.6.2011->5.7.2011 -> To be discussed	Appendix V 6.1.1.2	CAL1-3
2	tec	A	Energy consumption test condition	"Battery temperature requirements" : What does it mean ? --> "T°C of the test" ? need to precise this wording	Follow recommendation from ICE group regarding ambient temperature, in phase 1 only normal ambient temperature and in phase 2 consider cold ambient temperature. EU commision required to discuss about different temperature and external condition.	BEV	agreed	Appendix IV	?
3	tec/Overlap	OI	Road load	* Issue for vehicle with no mechanical neutral gear * consider the charging/recharging electrical energy during deceleration : to guaranty the same behavior on the "road" and on the chassis dyno	Follow recommendations from ICE group except in cases where there are differences for example no mechanical neutral gear. Agreed to consider minimum requirement. This will make flexibility for future technical development and prevent judgment variation by contracting parties. E-Lab subgroup made a proposal for ICE in Stockholm	ALL	9.5.2011->5.7.2011 -> propose to ICE	-	RL6
3 bis	tec/Overlap	OI	Road load	Coast Down Mode : there is a need for a coast down mode and where there are special requirement for electrified vehicles this will be addressed by the Elab subgroup.	To be discussed (see T&E proposal) : ICE proposal ok with a few corrections from E-lab E-Lab subgroup made a proposal for ICE in Stockholm	ALL	9.5.2011->5.7.2011 -> propose to ICE	-	RL6
4	tec/Overlap	OI	Low power vehicle	The vehicles which have difficulty to follow the prescribed cycle. (like as electrified vehicles for only urban)	follow development in the DHC group. Low power vehicles that will have problem following the driving cycle will be considered by the DHC group.	ALL	after DHC completed	-	?
5	tec	A	Emission worst test : to merge row 5 and row 29	General opinion to avoid to large number of tests. Only Japanese regulation has worst emission test for CD mode.	out of GTR scope Japanese worst emission test is out of gtr scope.. Same with No29	OVC(PHEV)	agreed	(6.1.1.2)	?

Open issue list2

	tech/polit/overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion	gtr text	VP2
6	tec	OI	Run in mileage	Run in mileage for test	300km or more (Evs) and for PHEVs ? EV:300km or more, PHEV->Follow ICE battery 300km ->agreed How about Vehicle run in mileage?300km? Japan Comment 18032012 Follow [paragraph for ICE vehicles requirement]. 4.1.2. and 4.2.2. It should be deleted..	Evs and PHEVs	1.6.2011->TBD	4.3.1.3	P0
6 bis	tec	A	Run in	Battery / ICE operation ratio during vehicle run in for OVC type HEV. Consider the necessity to define the "battery operation ratio" during "run in mileage"	HEV :Follow ICE OVC(PHEV) 1.Vehicle has default mode: Run in should be performed in default mode. 2.without default mode:manufacture recommendation. 3.Run in should be performed with CS mode.	OVC(PHEV)	9.5.2011->5.7.2011 ->agreed	4	P0
7	tec	OI for EV and for PHEV	Charging condition	to not regulate the possibility to soak outdoor, (proposed by Jp) ; Remark : actually maybe still an OI for PHEV (electric range impact) as well. Please to explain which country(ies) has (have) a problem to perform the charge of the battery inside ?	It could be a safety issue for by some contracting parties if we do not allow charging outdoor. Agreement:25+/-5degC . To be deleted outdoor condition.	OVC(PHEV)/BEV	1.6.2011->5.7.2011 ->agreed	Appendix IV 2.1.2.1	CD3
8	tec	A	Charging method	charging method	manufacture's recommended	OVC(PHEV)/BEV	agreed	Appendix IV	CD3
9	tec	A- P	Charging time	Soak time:12 hr or more, less than 36hr.Charging time: Stop with full charged. 4.5. The Lab-process group has decided to have 2 alternatives for the soak time: Alt 1: This conditioning shall be carried out for at least six hours and continue until the engine oil temperature and coolant, if any, are within ±2 K of the set point temperature of the room. At the request of the manufacturer, forced cooling down could be used with open bonnet, appropriate use of cooling fan. Alt.2: This conditioning shall be carried out at least 12 hours and maximum 36 hours, with closed bonnet in soak area environment without using a fan. So, before the test CD test for EV and OVC HEV, we propose to keep the choose between both options during the soak time with specific provision for the charge of the battery	Upper limit for charging time is 36 hr. To be discussed ICE proposal should be confirmed during validation test	OVC(PHEV)/BEV	1.6.2011 ->Validation test	Appendix IV	CD3

Open issue list3

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion	gtr text	VP2
10	tec	O+P	criteria for end of charging	which is the criteria "plug-off" : indication of charging completed from the vehicle and starting within 1 hour from plug off test procedure shall be applied (ACEA proposal)	Still an open issue.—See ACEA proposal To be confirmed during validation test for considering RCB fluctuation from charging completed to plug off.	BEV/PHEV	1.6.2011 ->Validation test	Appendix IV 2.1.2.2	CD4
10 bis		New OI	criteria for end of charging	see § End of charge criteria : to find a consensus on the "same conditions" before and after the test.	All Charging length : losses issue to deal with as far as energy consumption calculation is concerned. Do we have to take into account such losses in the procedure ? The purpose of such a discussion is to avoid double counting to be confirmed during validation test	EV/PHEV	1.6.2011 ->Validation test	Appendix IV 2.1.2.2	CD4
11	tec	P and OI	Interruption condition	Less than 3 minutes interruption is possible for every one cycle. During interruption, main power may be OFF.	still an open issue. Needs the driving cycle from DHC. For range test of EV :3minutes is acceptable(cycle:30min)->Validation test PHEV:to be discussed.	BEV/OVC(PHEV)	1.6.2011->5.7.2011 ->TBD(Validation test)	5.1.5.1.5	CD6-1
12	tec	OI	test termination condition	Test termination condition for range measurement	ACEA will make a proposal : Need to know the driving cycle in order to close the open issue. Japan proposed 4 seconds.->TBD	BEV/PHEV	9.5.2011 ->Validation test	5.1.5.3.1 5.3.2.5.4	CD7
13	tec	A	Stop condition	Proposed stop condition :Accel Off ,and press braking pedal when 5 km/h or lower to stop.	The range should be measured until break off criteria. Stop condition isn't necessary. Japan comment 18032012 Criteria of [test end] and how to stop the vehicle after reaching the criteria are still open.	BEV	agreed→TBD	5.3.2.5.4	CD7-1
13-bis	test/verif	OI	deceleration condition	ACEA proposal: to enable OEMs to fully take advantage of regenerative braking potentials, it should be allowed to disengage the clutch at deceleration periods. There may also be conventional ICE vehicle concepts with very long axle ratios where such an disengagement of the	To be discussed (not yet mature. To be reconsidered when the new cycle is known)	ALL	9.5.2011	-	-
14	tec	A	Initial Discharge condition	Initial Discharge condition before test: Discharge until manufacture's recommended level	agreement on the proposal and a wish that this should be optional and not a requirement. And also to add temperature condition for the discharge driving (?? To check this requirement --> A priori, the T°C should be the same as the one for the test ...)	BEV	1.6.2011->agreed	Appendix IV 2.1.1	PC1
15	tec	OI	Watt-hour meter measurement accuracy	US and JP: +/-2% EU: +/-0.2%	Japan proposed +/-0.2%	BEV/OVC(PHEV)	9.5.2011->5.7.2011 ->TBD(Validation test)	Appendix III 2.1	EQ1
16	tec	OI	Accuracy of ammeter	JP: +/-1% F.S. EU: +/- 0.5%	Japan proposed +/-0.5%. But ACEA coment: +/-0.5% is difficult.->TBD	EV/OVC(PHEV)	9.5.2011->5.7.2011 ->TBD(Validation test)	Appendix III 2.1	EQ2
17	tec	OI	LOD of ammeter	JP:0.0001Ah (<=50A) 0.001Ah(>50A) EU: No regulation	Japan proposed minimum measurable integration amount which regulated Jpn regulation.	EV/OVC(PHEV)	9.5.2011->5.7.2011 ->TBD(Validation test)	Appendix III 2.1	EQ2

Open issue list4

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion	gtr text	VP2
18	tec	A	RCB(SOC)	Definition;Rename " SOC" to "RCB". RESS (Rechargeable energy storage system) ECB (RESS Charge Balance)	To be discussed	ALL	agreed	2.4.4	-
19	tec	A	RCB(SOC)	For CS mode, it could be necessary to compensate the CO2/fuel consumption based on SOC balance RCB to obtain correct value. (for CD mode, no need to compensate).	Need results about the driving cycle from the DHC group to continue the discussion. Same with No26	OVC(PHEV)	agreed	6.2.1.2.3	CAL2
20	tec	OI	CD test	calculation method for CD test (fuel consumption)	ACEA will discuss internally.TBD	OVC(PHEV)	5.7.2011->TBD		CD
21	tec	OI	EAER determination : (CO2-related)CO2 compensation for range test	Separation point of CD mode and CS mode in one cycle is agreed but the method on how is still an open issue.	ACEA will make a proposal.	OVC(PHEV)	5.7.2011 ->Validation test	6.4.1.3	CD7
22	tec	P	Electric range : Shorten the test procedure	Current requirement (full charge to empty) is basic procedure. As an option, need to adapt the shorten procedure to reduce testing burden (i. e. SAE J1634)	To be discussed	BEV/OVC(PHEV)	5.7.2011->TBD	-	-
24	Overlap with ICE	OI	Ambient Air Correction	Open issue from ICE group. Intake air emission should be subtracted from tail emission.	To be considered. Follow ICE group.	ALL	follow ICE	-	-
25	Tec	OI	For detection of CS condition : RCB break off criteria	1) <u>ACEA and JAMA agree on the principle to perform n+1 test sequence to confirm the end of CD test and define the transient cycle as the test n.</u> If the battery energy used during each test sequence is less than a certain value [to be defined in % of fuel consumption], so the cycle before (test n) is the transient one. <u>As an option</u> , the fuel consumption value of the test sequence x could be compared to the fuel consumption measured at CS test. 2) <u>Definition of the break off criteria:</u> ACEA proposal : absolute NEC* as a % of cycle energy demand or % of total energy used (to be discussed) * NEC = Net Energy Change = RCB x nominal voltage of RESS (Proposal to be checked : the test is considered to be	Actions : 1) method to be developed to determine the cycle energy demand and then to define the value ; 2) to check Renault's proposal (26/05/2011) and to reformulate it if any. (The [values] are given as an indication but have to be well defined) ->Need Validation Test to fix the value of NEC. Japan Comment 18032012 Vote for Option2	OVC(PHEV)	9.5.2011->5.7.2011 ->Validation test	2.4.13 2.4.14 5.1.3.3.2 5.1.3.3.3	CD6-5
25 bis	New tec	A	For detection of CS condition : RCB break-off criteria	= new O.I. to be discussed with EC / JRC, other experts to find an acceptable way to measure in safety conditions or to pick-up the voltage information from the car If the absolute NEC is not measurable for safety reason and the CAN solution not accepted, we will have to find an alternative proposal	To be measured in Ah	OVC(PHEV)	9.5.2011->5.7.2011 ->deleted	-	-
26	tec	A	RCB correction	Japan proposal:All emissions should be corrected. ACEA proposal:FC/CO2 should be corrected.	All emission should be corrected,excluding no relation with emission value. Need to consider AP constituents including PN/PM.	PHEV	deleted	-	-
26	New tec	A	RCB correction	JAMA and ACEA agree to only correct CO2 and fuel consumption. No relevance for pollutant emissions because no relationship between RCB and pollutant emissions	Tests related to CO2 correction factor elaboration are used to show that pollutant emissions comply with the limit values and no relationship with RCB. So, it means that specific tests should not be required for certification test. The non relationship between RCB and pollutants emission can be showed with manufacturers internal data associated to the CO2 measurements	NOVC HEV and PHEV in CS test	5.7.2011->agreed	Appendix I	CAL2

Open issue list5

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion	gtr text	VP2
26 bis	New tec	OI	RCB correction	Need for a clarification regarding statement from ACEA and JAMA. Both agrees that there is no need for pollutants emission correction unless there is evidence for a correction. Remark from ACEA there is the Matador study that could give clarity for the need of a correction. Japan is of the opinion that since there is correction for CO2 there is no extra burden for the manufacturer and that correction for critical emissions could be applied. Comment from Japan, additional pollutants will be regulated in the WLTP process. The Japanese government will require to show to influence of different RCB.	Need of pollutants emission correction if evidence to be discussed for final clear position. Especially, if there is relationship between RCB and pollutants emissions but in any cases the pollutants emission comply with the limit value : should we need to correct as well ? (Zurich)	NOVC HEV and PHEV in CS test	5.7.2011 ->TBD	6.1.1.1 Appendix II	CAL2
27	tec	OI	RCB correction criteria (window definition) CO2-related	ACEA proposed the tolerance a window (% of fuel energy) in which there is no RCB correction. Japan does not agree. But JAMA could agree with ACEA as per a reasonable window definition	ACEA will make a proposal until 18th March : RCB window without correction needed; in case of exceeding the 1% (of fuel energy used) a correction calculation is required.	NOV HEV and PHEV in CS test	5.7.2011 ->Validation test	6.2.1.2.4 6.2.1.2.5	CAL2
28	tec	A	CS test achievement : E1/Eo criteria	Only Japanese regulation: If necessary, to confirm E	Japan will confirm the necessity and reason. ->Japan agreed to delete this criteria.	OVC(PHEV)	agreed	-	-
29	tee	A	GD-EM-test	Only Japanese regulation has worst emission test for CD mode.	Japanese worst emission test is out of gtr scope.	PHEV	deleted	-	-
30	tec	OI	energy efficiency Calculation of electric consumption of CD range	Japan proposal: to be calculated by EAER ACEA proposal: to be calculated by RCDA (or Rcdc : to be checked)	ACEA/JAPAN will provide the concrete calculation sample, then discuss its advantage/disadvantage ->TBD	OVC(PHEV)	5.7.2011 ->TBD	6.4.1.3	CAL3-2
31	tec	OI	AER City	There is an interest for EV and OVC HEV with low power engine and even with full capable engine to consider such an electric range like AER city (which means low speed part(s) of the WLTC). As far as NOVC HEV are concerned, we have to consider the interest to get this pure electric driving information with the EU Commission as well.	To discuss with all together and especially along with the European Commission. L+M phase should be AER City. AER City should be optional test for customer information. JapanComment 18032012 Weighting each phase is still open.	BEV/OVC HEV	5.7.2011 ->TBD	5.3.2.6 6.4.2.2	TBD
32	tec	P	performance info.	additional performance item(s) may be necessary for customer information, e.g. B charge time	EC ask JRC? for study	BEV/OVC(PHEV)	September	-	-
33	tec/overlap	OI	gear box/multi modes	See ICE group proposal according to the presence or not of a default mode : number of tests to perform for pollutants emissions and CO2/fuel consumption ..	To check if it is transposable to electrified vehicles ? To be discussed	All	1.6.2011 ->Check ICE proposal	5.1.1.3	P3
34	tec	A	CD test : pollutants emissions compliance	Discussion about requirement on emissions during CD test. The Japanese legislation requires emissions compliance during CD test and the manufacturer is to provide documentation that for different <u>output</u> SOC there is also compliance with emission standards. ACEA is of the opinion that the GTR requires emissions compliance during all conditions and therefore additional test is not required.	Final decision of the group confirmed on 31/03/2011 : agreement to remove such requirement (additional tests) from the GTR and to let it only at the regional request that is to stay at the Japanese government request if needed.	OVC(PHEV)	agreed	-	CAL1-2
35	tec overlap with ICE	OI	12 voltage battery	See ICE proposal and give the E-lab position	To be discussed	NOVC HEV /OVC(PHEV)	TBD	-	PC8
38	overlap with ICE	OI	scope of E-lab	Does the group to handle hybrids vehicles as well or hybrids vehicles are part of ICE group ?	DTP_E-lab group has to discuss with ICE group		GRPE	-	-

Open issue list 6

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion	gtr text	VP2
37	tec	A	REESS	RESS renamed REESS in GRSP (R100).	Definition of RESS should be corrected.	ALL	26-28.3.2012	2.2.2	-
38	tec	OI	EV mode	Most electric energy consuming hybrid mode or most electric energy consuming mode, such as EV mode should be considered for CD test.	For Validation phase 2, Option 3 should be evaluated and Option 1 and 2 will be additional.	OVC HEV	26-28.3.2012	2.6.3 2.6.4 5.1.1.7.1	?
39	tec	OI	R101 revision For EAER test	->	To be discussed	OVC HEV	26-28.3.2012	5.1.15	CAL3-2?
40	tec	A	Range measurement	->	The significant figure for the range value (AER, AER city, EAER and so on) should be for calculation 0.1km, for report nearest whole number.	ALL	26-28.3.2012	3.4	CAL3
41	tec	OI	Soak time between each phase	->	Soak time between each phase should be validated during validation phase two.	ALL	26-28.3.2012	5.1.3.3	CSL6
42	tec	OI	Start of charge	->	The time for the start of charging after test (30 minutes) should be validated during validation phase two.	BEV/OVC(PHEV)	26-28.3.2012	5.3.2.5.5	CD9
43	tec	OI	Fuel consumption formula	ACEA proposed with the unit l/100km	Japan will propose fuel consumption formula with unit (km/l) as an option to (l/ 100 km).	except BEV	26-28.3.2012	Appendix II 1.3.1	CAL4-1
44	tec	OI	Charge depleting	Description of relationship with CS is more understandable.	Add [until change to charge sustaining operation].			2.4.1	
45	tec	OI	Electric energy consumption	Electric energy consumption of CD operation.	How to use? Japan comment			6.3.1.3	
46	tec	OI	weighted total AC electric energy consumption	Utility factor weighted total AC electric energy consumption including charging loss.	How to use? Japan comment			6.3.1.1	
47	tec	OI	RCDA	Option 2 needs absolute SOC, but no measurement method has been established.	Japan comment Vote for option 1			6.4.1.5	