IWG A-LCA
SG4 Use Phase
Status Update

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Discussion items for SG4

❑ System Boundaries

❑ Representative vehicle

❑ $CO2\_eq$ calculation

❑ In-use Energy/Fuel consumption

❑ Maintenance and Consumables

❑ Level Concepts for SG4

❑ Next steps

System Boundaries

	area	SG4 Decision	rule				existing methods					Your Position
			ToR purpose	fixed or varied	primary or secondary	(any other suggestions are welcome)	A	B	C	D	...	
Transportation												
mining to initial processing plants	SG2		NA		NA(secondary)		NA					
between initial processing plants	SG2		NA		NA(secondary)		NA					
deliver to part/production plants	SG2/3		NA		NA(secondary)		NA					
within the part/production plants	SG3		NA		NA(secondary)		NA					
between part/production plants	SG3		NA		NA(secondary)		NA					
deliver to customer	SG3/4		NA		NA(secondary)		✔					
maintenance parts	SG4	OK	NA		NA(secondary)	Notify other SGs that are involved in these topics.	✔					
fuel	SG4	SG6?	NA		✔(primary)		✔					
electricity	SG4	SG6?	NA		✔(primary)		✔					
deliver to disposal plants	SG4/5		NA		NA(secondary)		NA					
deliver to the parts recover plants	SG5		NA		NA(secondary)		NA					
recover plants to production plant	SG5/3		NA		NA(secondary)		NA					
...												
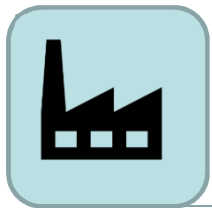
In-use energy consumption & GhG emissions

Regular consumptions

Maintenance

Covering activity from circulation to end-of-life

Representative Vehicle

❑No formal 'Representative Vehicle ' definition available so far

❑**Scope**: to provide LCA carbon footprint information of a group of vehicles and at the same time accurate enough for the purpose – different for each LCA level

❑Find a good compromise between precision and administrative burden instead of TVV approach

   ❑ IP family as defined by EU WLTP regulation
   ❑ Vehicle High as worst-case approach
   ❑ Level default value to be defined

❑Broader definition might be adopted for maintenance, evaporative emissions, etc… for a simpler approach

❑Need to align different methodologies among regions

❑Align with SG3
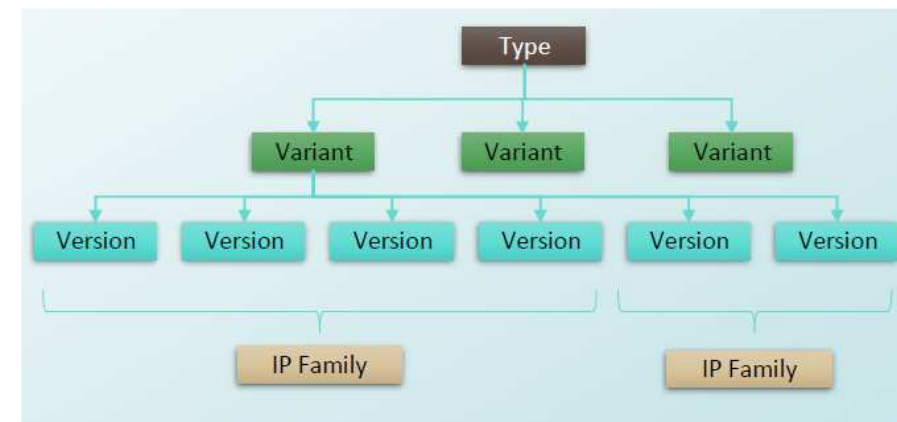
CO$_2$eq Calculation/Functional Unit

		(	Fuel consumption	×	conversion factor	+	Energy consumption	×	conversion factor	)	×	lifetime distance	+	(	Production and/or Disposal Energy per Consumables and/or	×	conversion factor	×	Frequency	)	+	Leakage ? (evaporative emission, Hydrogen, ,,,)
	unit		L(g)/km		CO2_eq/L(g)		MJ/km		CO2_eq/MJ			km			MJ		CO2_eq/MJ		x / lifetime			
responsible to	SG3															✔							
	SG4		✔				✔						✔							✔			✔
	SG5															✔							
	SG6				✔				✔									✔					
applicable powertrain	ICE		✔		✓		NA		NA				✔			depend on the items		depend on the items		depend on the items			✔
	NOVC-HEV		✔		✓		NA		NA				✔										✔
	OVC-HEV		✔		✓		✔		✓				✔										✔
	PEV		NA		NA		✔		✓				✔										NA
	FCHV		✔		✓		NA		NA				✔										✔
	LPG/CNG		✔		✓		NA		NA				✔										✔

SG6 to determine conversion factors

Evaporative emissions

Hydrogen leakage

LPG/CNG leakage

Brainstorming

In-use Energy/Fuel consumption

❑Two options under discussion:

   ❑Option 1: **Homologation value** X **Deterioration factor** X **Real-world adjustment factor** (or discrepancy factor)

      ❑Discrepancy and deterioration factors can be '1' for level 1 or if data are not available. Normally they are region specific

   ❑Option 2: Real-world data (OBFCM) to be further elaborated – vehicle-specific data are available in some regions

❑General consensus on Option 1 but agreement can be achieved once formally written down

❑Both options have to be further developed and tailored to the different levels foreseen by the methodology

Maintenance and Consumables

❑ General agreement: *"Guideline will provide a recommended list of parts /powertrain (non-exhaustive) then OEM need to provide a complete list with frequency of maintenance (with justification). The emission factors we need to go with SG3 recommendations."*

❑Currently SG4 is working on developing the 'list of parts'

		Gasoline	Diesel	CNG	NOVC-HEV	OVC-HEV	Pure EV	FCHV	OVC-FCHV	H$_2$-ICE	...
Consumables	Engine Coolant	✓	✓	✓	✓	✓	-	-	-	✓	
	Engine Lubricant	✓	✓	✓	✓	✓	-	-	-	✓	
	Screen Wash	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Break fluids	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Electric Drive Unit Fluid	-	-	-	✓	✓	✓	✓	✓	-	
	Transmission fluid	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Refrigerant	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AdBlue/Urea	-	✓	-	-	-	-	-	-	-	
Maintenance parts	Passenger Air Filter	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Engine Filter	✓	✓	✓	✓	✓	-	-	-	-	
	Spark plug	✓	-	✓	✓	✓	-	-	-	-	
	Windshield Wiper Blades	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Tires	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Brake linings	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	SLI Battery (12V)	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Aftertreatment	✓	✓	✓	✓	✓	-	-	-	-	
	Traction Battery	-	-	-	✓	✓	✓	✓	✓	-	
	Fuel cell	-	-	-	-	-	-	✓	✓	✓	

Under discussion

Level Concept for SG4 - JRC

USE PHASE	Reference Vehicle	Representativeness	Energy consumption		Maintenance	Service Life
			In-use	Charging		
Level 4	Specific OEM's **complete** vehicle model – as delivered OR IP family specific	Vehicle specific OR IP family specific	Homologation value corrected based on RW characteristic value (based on OBFCM or similar data provided by operators or adjustment factor)	Vehicle specific charging eff (at vehicle level, which standard?) **Still to be Discussed** OEM average efficiency (standardised?)	Model/IP Family specific	OEM/Model specific average data **Still to be Discussed** Regional with option to declared higher life
Level 3	Vehicle variants (same manufacturer/company, same essential body parts, body type, powertrain tech/energy carrier, same axles/class). Can be **incomplete**.	OEM/Model Variant	OEM-resolution and assumptions for RW performance corrected per adjustment factor		OEM Variant Specific	
Level 2 to be determined, necessary if we want to be aligned with the other SGs. Possible idea, extension of level 1 with split per vehicle segment and using sales weighted characteristics for specific regions (EU, US, Japan, China etc)						
Level 1	General concept distinguishing per powertrain tech/energy carrier/size/emission standard and use.	Regional (EU/US/JP/KR/CN…) eg Guidebook, MOVES etc	Regional typical inventory or other local representative realistic data (eg EEA guidebook)	Regional typical charging eff value **Still to be Discussed**	Generic/regional	Regional typical service life for each vehicle type **Still to be Discussed**

20/02/2024

Next steps - SG4 interactions

❑Definition of "Representative vehicle"
   ❑Interaction with SG3

❑ System boundaries and Infrastructures
   ❑Interaction with SG3,SG5 and SG6

❑Maintenance
   ❑Interaction with SG3 on availability of carbon emission data (primary /secondary), emission factors for CO2 calculation

Next steps

❑Define CO_{2eq} calculation formula and functional units

❑Finalize Level Matrix

❑Progress on Maintenance and Consumables
- ❑Complete list of maintenance items
- ❑Develop methodology for frequency of maintenance

❑In-use consumption
- ❑ Service life definition and data collection
- ❑ data TA+Correction coefficient/OBFCM or local inventory

❑SG4 meeting on March tbd

SG4 Meeting Schedule Plan

November	December	January	February	March	April
5th – SG4 4th meeting	4th – A LCA 12th IWG	8/9th – A LCA 13th IWG @Geneva	7th – SG4 8th workshop		– SG4 9th meeting
	12th – SG4 6th meeting	16th – SG4 7th meeting	20th – A LCA 14th IWG	– SG4 9th meeting	18/19th – A LCA 15th IWG @Seoul

Thank you

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