# IWG A-LCA
# SG4 Use Phase
# Status Update

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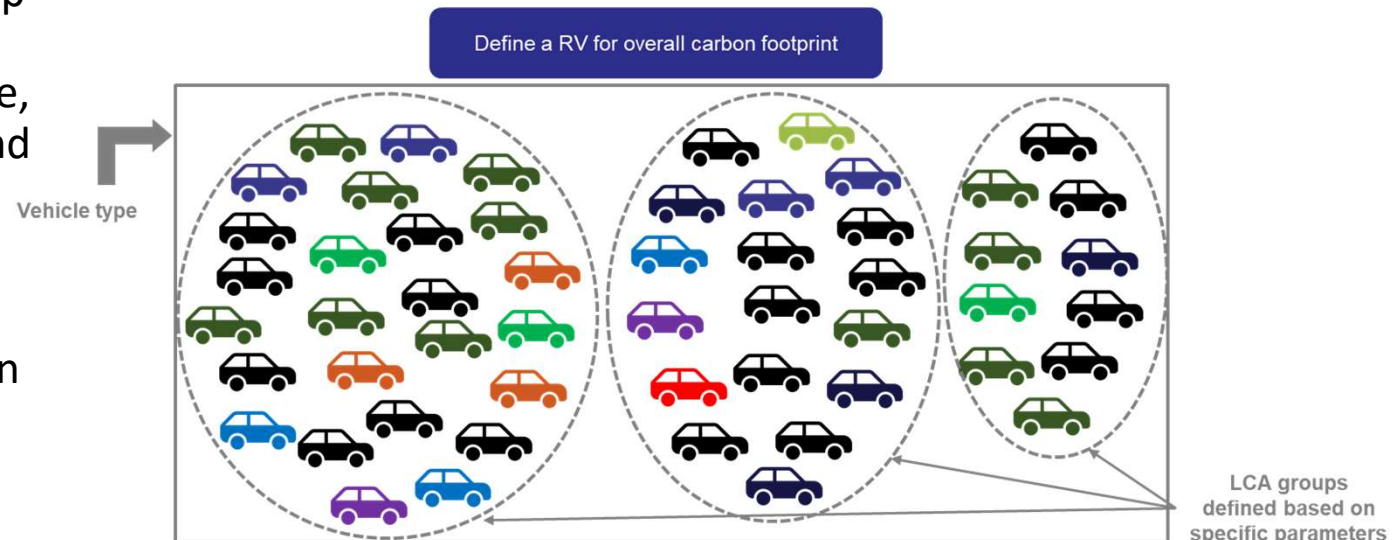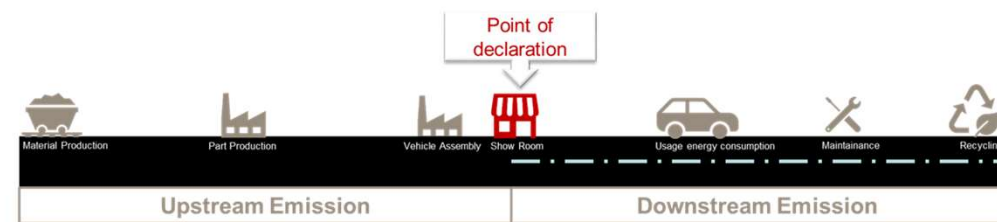Samarendra Tripathy (OICA) - samarendra.tripathy@renault.com

# Decision Status in SG4

| List of Topic | Status | | |
|---|---|---|---|
| | Concept /Orientation | Methodology (Detailed requirement) | Draft (justification & guideline) |
| System Boundary | Agreed | Under discussion | Not started |
| Service life | Under discussion | Not started | Not started |
| Energy consumption | Agreed (tbc in next SG4) | Under discussion | Not started |
| Other leakage | Under discussion | Not started | Not started |
| Maintenance | Agreed | Agreed (tbc in next SG4) | Under discussion |
| Representative vehicle | Under discussion | Not started | Not started |
| Level concept | Under discussion | Not started | Not started |

# Discussion items for SG4

❑Representative vehicle

❑Service Life

❑Maintenance and Consumables

❑Level Concepts for SG4

❑System Boundaries

❑Next steps

# Representative Vehicle

❑ No official 'Representative Vehicle ' definition available so far

❑ **Scope**: to provide LCA carbon footprint information of a group of vehicles with similar parameters (e.g. drivetrain type, vehicle weight, hotspots, ...) and at the same time accurate enough for the purpose – different for each LCA level

❑ Definition still under discussion



Point of declaration

Material Production | Part Production | Vehicle Assembly | Show Room | Usage energy consumption | Maintainance | Recycling

Upstream Emission | Downstream Emission

Define a RV for overall carbon footprint

Vehicle type

LCA groups defined based on specific parameters

# Service life : Potential use

**1] Potential Functional unit: /vehicle**

$CO_{2e} = CO_{2e\ Material} + CO_{2e\ Production} +$ **$CO_{2e\ Use\ phase}$** $+ CO_{2e\ Recycling}$

$CO_{2e} = CO_{2e\ Material} + CO_{2e\ Production} +$ **$(EC\ X\ CF\ X\ Service\ life) + CO_{2e\ maintenance} + CO_{2e\ leakage}$** $+ CO_{2e\ Recycling}$

**2] Potentiel Functional unit : /km**

Functional unit = $CO_{2e}$ /Service life

$$= \frac{CO_{2e\ Material} + CO_{2e\ Production} + \textbf{(EC X CF X Service life)} + CO_{2e\ maintenance} + CO_{2e\ leakage} + CO_{2e\ Recycling}}{Service\ life}$$

- Depending upon usage service life will impact the 'functional unit' differently

# Service life : status

**Key feedbacks:**
- Different service life used by OEMs => not harmonized
- Service life values varies between standards => not harmonized
- Different service life per region => EU vs US vs BR
- Different service life per powertrain => diesel vs petrol
- Different service life per segment => small vs medium vs large

**Open questions :**
- Different service life per region => region will decide the value ? Present orientation is to decide service life at region level
- Different service life per region per powertrain ? => Present orientation is not to distinguish between powertrain due to comparability between different powertrains
- Different service life per region per segment ? => Present orientation is to consider vehicle segments in level concept . More discussion in next meeting.
- Initial years consume more energy => Dynamic energy modeling or not ? If YES how to handle ? If NOT how to justify ?
- Significant share of vehicle leave country of registration => how to handle ? If NOT how to justify ?

# Maintenance and Consumables

❑ Two types of maintenance are included in the guideline:

  ❑ Consumables: items that will need to be refilled periodically

  ❑ Maintenance parts: replacement of parts due to normal wear and tear, including components that are not designed to last the entire lifespan of a vehicle

❑ Since the carbon footprint related to maintenance occurs after the vehicle is placed on the market, CF can only be estimated based on statistical data

❑ If list of maintenance parts/consumable and associated frequency is provided by the OEM

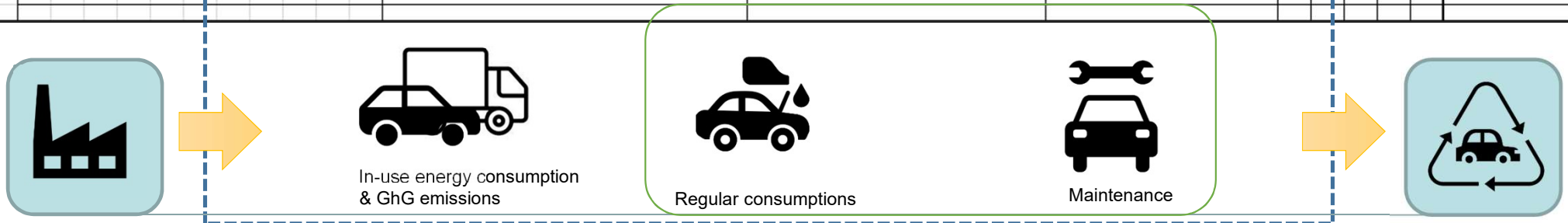$$CO_{2eq.maintenance} = \sum_{i=1}^{n} CEF_i * f_{i.maintainence}$$

❑ SG4 working on a list of consumables and parts for guidance and should not be considered as exhaustive. The OEM should provide the list adapted to the powertrain and vehicle segment for which the carbon footprint is calculated

❑ If list of maintenance parts/consumable not available then a fixed percentage of upstream emission can be attributed

# Level Concept for SG4 - JRC

| USE PHASE | Reference Vehicle | Representativeness | In-use consumption | Maintenance & Consumables | Service Life |
|---|---|---|---|---|---|
| Level 4 | IP/LCA family specific | IP/LCA family specific | Homologation value corrected based on RW characteristic value (based on OBFCM or similar data provided by operators or adjustment factor) | Model/IP Family specific | OEM/Model specific average data |
| 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 | Regional with option to declared higher life |
| Level 2 | to be determined. 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) | Generic/regional | Regional typical service life for each vehicle type |

# 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) | | ✔ | | | | | SG3 |
| maintenance parts | SG4 | | NA | | NA(secondary) | | ✔ | | | | | ok |
| fuel | SG4 | | NA | | ✔(primary) | | ✔ | | | | | SG6 |
| electricity | SG4 | | NA | | ✔(primary) | | ✔ | | | | | SG6 |
| deliver to disposal plants | SG4/5 | | NA | | NA(secondary) | | NA | | | | | SG5 |
| 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

# System Boundaries
## SG3/SG4 Transition Point
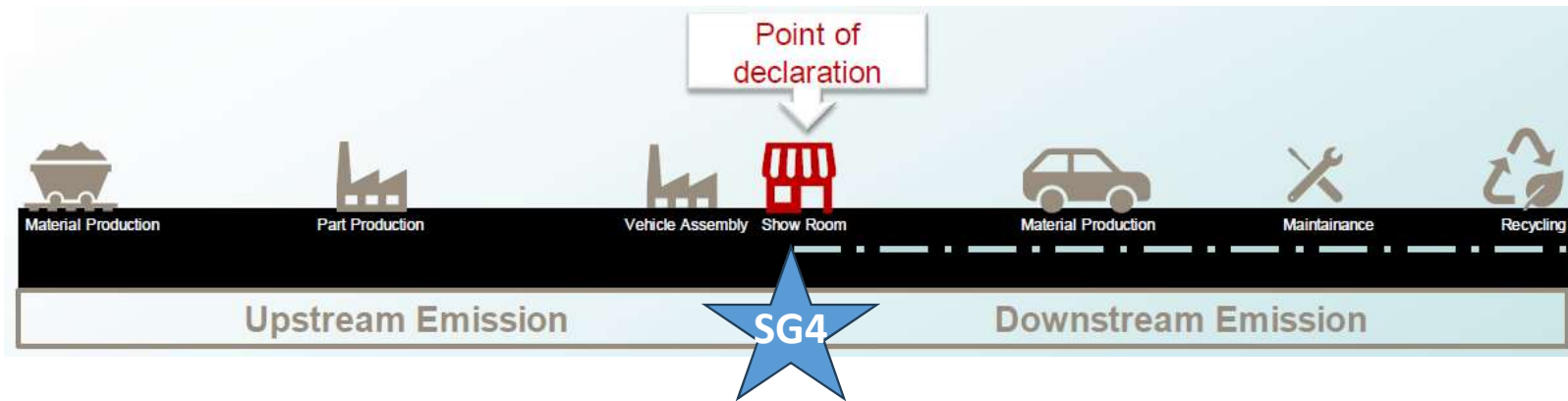


**SG3** and **SG4** agreed that the hand over point is set at the "showroom, when the vehicle is passed on from the OEM to the final customer"
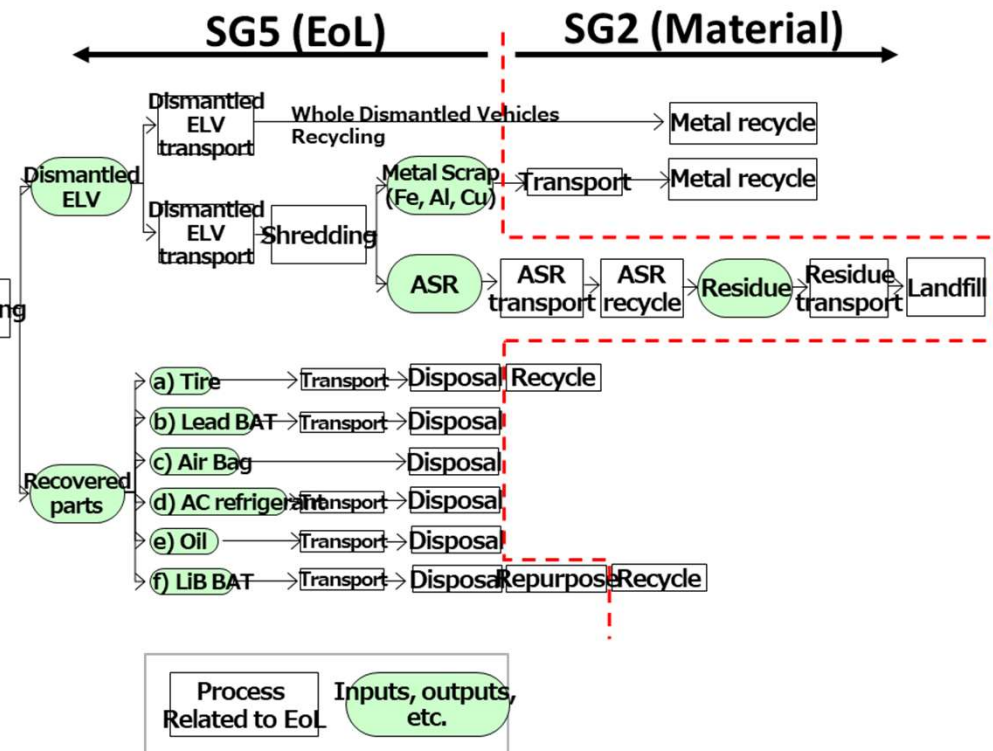
# System Boundaries
## SG4/SG5 Transition Point

**SG5** affirms that:
" GHG emissions after ELV (End-of-Life Vehicle) generation fall within the EoL domain.

Therefore, it is acknowledged that the transportation of ELVs should be included within the EoL domain"

# Next steps

❑Finalize $CO_{2eq}$ calculation formula and functional units

❑Finalize Level Matrix

❑In-use consumption

　❑ data TA + Correction coefficient/OBFCM

❑Finalize methodology for Maintenance and Consumables

❑Progress on service life

❑Next SG4 meeting on April 23rd

❑Schedule upcoming meetings

# Next steps

❑ Definition of "Representative vehicle"
  ❑ Interaction with SG3

❑ System boundaries and Infrastructures
  ❑ SG3 > agreed transition point at "Showroom" level
  ❑ SG5 > agreed transition point at EoL
  ❑ SG6 > define boundary for fuel and electricity (charging?) and conversion ratios

❑ Draft Maintenance & Consumables methodology

❑ LCA point of declaration < Overarching aspect - IWG

# SG4 Meeting Schedule Plan

| January | February | March | April | May | June |
|---|---|---|---|---|---|
| 8/9th – A LCA 13th IWG @Geneva | 7th – SG4 8th workshop | | 9th – SG4 10th meeting | | |
| 16th – SG4 7th meeting | 20th – A LCA 14th IWG | 18th – SG4 9th meeting | 18/19th – A LCA 15th IWG @Seoul | TBD | TBD |
| | | | 23rd – SG4 11th meeting | | |

# Thank you

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