

A-LCA-10-03

# A-LCA IWG SG2 Discussion item info. share to IWG

2023.Sep.07

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## **Purpose of SG2 activity**



## **Purpose**

 Set an internationally harmonized material carbon intensity which enables a material technology to evaluate LCA toward carbon neutral

#### <Point of views>

- Usage of recycled material, yield (or loss) rate
- Development of global data which enables consideration of regional electric power effect.

#### **Discussion item for SG2**



- > Definition of Activity data & Intensity Data
- >Primary Data concept (level concept)
- > Definition of Material list for Automotive LCA
- >System scope & boundary
- >How shall we collect data
- >Global & Regional Secondary data handling
- >Secondary data definition/which DB to use (incl. data quality)
- >Verification of data

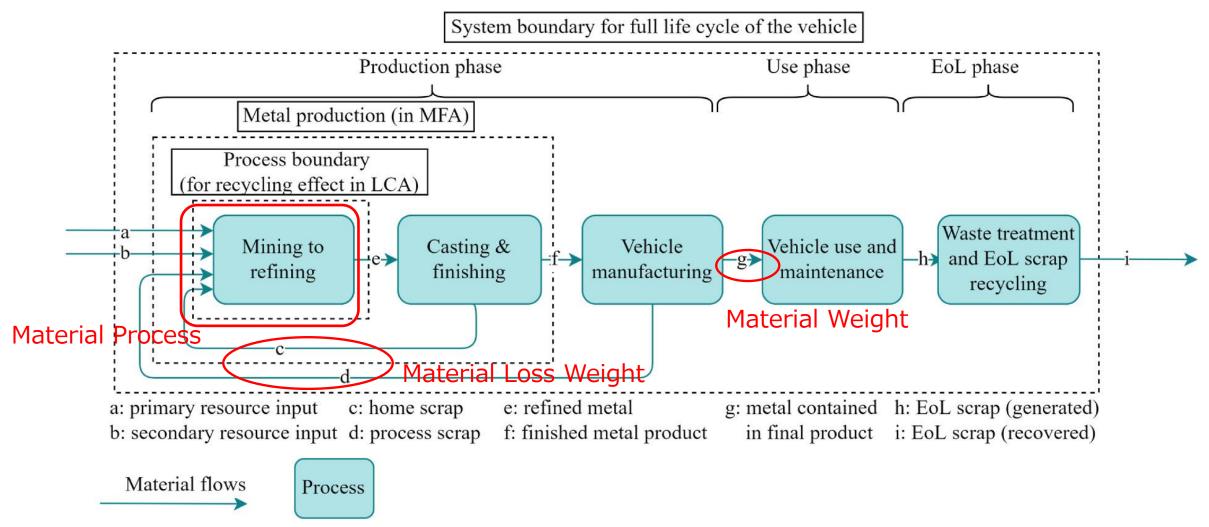
## Overall schedule plan



			20	23			2024						
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	2Q	3Q	4Q	-
IWG MTG				*									
SG2 Purpose agreement													
Definition of Activity data & Intensity Data		-											
Primary Data concept		<del></del>											
Definition of Material list for Automotive LCA			<b>**</b>										
System scope & boundary													
How shall we collect data									-				
Global & Regional Secondary data handling										<b></b>			
Secondary data definition/which DB to use												<b></b>	
Verification of data													
Drafting													<b>—</b>

## **Definition of Activity data & Intensity Data**





reference: (2)Impact of recycling effect in comparative life cycle assessment for materialsselection - A case study of light-weighting vehicles <a href="https://www.sciencedirect.com/science/article/pii/S0959652622009465?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S0959652622009465?via%3Dihub</a>

## **Primary Data concept (level concept)**



Level		Activity Data		Intensity Data		
	Vehicle Wight [kg]	Material Distribution [%]	Scrap Rate of Material [%]	Carbon Intensity of Material Acquisition [kg-CO <sub>2</sub> e/kg]		
Level1	Primary data	All Secondary data	All Secondary data	All Secondary data		
	<b>Amount of Materia</b> l [k	_	Scrap Rate of Material [%]	Carbon Intensity of Material Acquisition [kg-CO <sub>2</sub> e/kg]		
Level2	All Prima	ary data	All Secondary data	All Secondary data		
Level2.5	1		Partially Primary data	<b>↑</b>		
Level3	1		All Primary data	<b>↑</b>		
Level3.5	1		<b>↑</b>	Partially Primary data		
Level4	1		<b>↑</b>	All Primary data		

## **Definition of Material list by VDA**



#### **VDA** material

VDA	VDA Classification Name					
Classification	VDA Classification Name					
1.1	Steel/cast steel/sintered alloys					
1.1.1	Unalloyed/low alloy steel					
1.1.2	high-alloy steel					
1.2	cast iron					
1.2.1	Gneissic graphite cast iron/ malleable cast iron					
1.2.2	Spheroidal graphite cast iron/Vermular cast iron					
1.2.3	high-alloy cast iron					
2.1	Aluminium / aluminium alloys					
2.1.1	Cast aluminium alloys					
2.1.2	Forged aluminium alloy					
2.2	Magnesium, magnesium alloys					
2.2.1	Cast magnesium alloy					
2.2.2	Forged magnesium alloy					
2.3	Titanium, titanium alloys					
3.1	Copper (e.g. copper in harnesses)					
3.2	copper alloy					
3.3	zinc alloy					
3.4	nickel alloy					
3.5	lead (the metal)					
4.1	Platinum/rhodium					
4.2	Other special metals					



## Not enough to show low CO2 material effect by VDA classification

5.1	thermoplastic resin
5.1.a	Thermoplastic resin (containing filler)
5.1.b	Thermoplastic resin (without filler)
5.2	thermoplastic elastomer
5.3	Elastomer/elastomer composites
5.4	thermosetting resin
5.4.1	polyurethane
5.4.2	unsaturated polyester
5.4.3	Other thermosetting resins
5.5	Polymer composites (e.g. laminated trim parts)
5.5.1	Resins in polymer composites.
5.5.2	Fibres in polymer composites (textiles)
6.1	painting material
6.2	Adhesives, sealants
6.3	underseal
7.1	Organic natural materials (e.g. leather)
7.2	Ceramics/glass
7.3	Other composite materials (e.g. friction linings)
8.1	Electronic component materials (e.g. PCBs, displays)
8.2	Electrical component materials
9.1	fuel
9.2	lubricant
9.3	brake fluid
9.4	Coolant/other glycols
9.5	refrigerant
9.6	Washer fluid, battery fluid
9.7	preservative
9.8	Other fuels and replenishers
	Tyre
	lead-acid battery
	Drive battery cell

## Vehicle hot spot analysis due to material type



#### **Initial study**

<IMDS> ·Parts list ·VDA Mat.Type & Weight

X

·Carbon **Intensity Data** (2011y)JAMA)

■ Ma	aterial types
١	/DA material definition
1.1	Steel/cast steel/sintered alloys
1.1.1	Unalloyed/low alloy steel
1.1.2	high-alloy steel
1.2	cast iron
1,2,1	Gnoissic graphite cast iron/ malloable
	cast iron
1 2 2	Spheroidal graphite cast iron/Vermular cast iron
1.2.2	iron/Vermular cast iron
1.2.3	high-alloy cast iron
2.1	Aluminium / aluminium alloys
2.1.1	Cast aluminium alloys
2.1.2	Forged aluminium allov
2.2	Magnesium, magnesium alloys
2.2.1	Cast magnesium alloy
2.2.2	Forged magnesium alloy
2.3	Titanium, titanium alloys
3.1	Copper (e.g. copper in harnesses)
3.2	copper alloy
	zinc alloy
	nickel alloy
3.5	lead (the metal)
	Other special metals
	thermoplastic resin
5.1.a	Thermoplastic resin (containing filler)
	Thermoplastic resin (without filler)
	thermoplastic elastomer
5.3	Elastomer/elastomer composites
5.4	thermosetting resin
	polyurethane
5.4.2	unsaturated polyester
5.4.3	Other thermosetting resins
5.5	Polymer composites (e.g. laminated
	tilli parts)
5.5.1	Resins in polymer composites.
	Fibres in polymer composites (textiles)
	painting material
6.2	Adhesives, sealants
	underseal
7.1	
7.2	Ceramics/glass
7.3	Other composite materials (e.g.
	friction linings) Electronic component materials (e.g.
8.1	PCBs, displays)
8.2	Electrical component materials
	fuel
	lubricant
	brake fluid
9.4	Coolant/other glycols
9.5	refrigerant
9.6	Washer fluid, battery fluid
9.7	
	Other fuels and replenishers

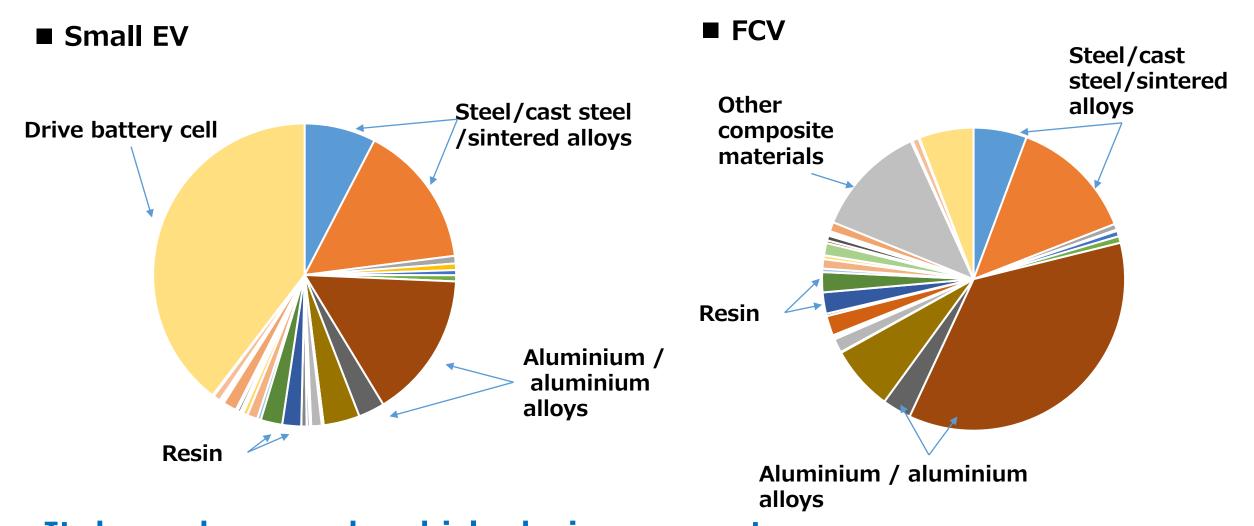
■ Pa	ssen	ger d	car/N	<b>1C</b>		■Tru	ck		<b>=</b> [	Pas	ssen	ger	car	ICE	/HE	V (b	oattery, tire)
Small CE	Mid FCV	Small EV	Mid HEV	Small 2R	Mid 2R	Small	Small HEV	Large		CE ody	ICE Lead acid battery	ICE Tire (4)	MHEV Body	MHEV Lead acid Battery	MHEV Li ion battery	MHEV Tire (4)	
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0.1% 0.3%	0.0% 0.1%	0.0% 0.1%	0.0% 0.2%	0.0%	0.0% 0.5%	0.0%	0.0% 0.3%	0.0% 0.1%		0.0%	0.0%	0.0% 0.0%	0.0%		0.0% 0.0%	0.0%	uoiiiiiaiit
0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	
0.0%	0.0% 0.0%	0.0% 0.0%	0.0% 0.0%	0.0% 0.0%	0.0%	0.19	0.1% 0.0%	0.0% 0.0%		0.4%	29.3% 0.0%	0.0% 0.0%	0.0%		0.0% 0.0%	0.0%	
0.07	0.0%		0.0%			0.07		0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		

↑ Total: CO2 100% as each vehicle (JPN OEMs)

## Vehicle hot spot analysis due to material type



#### **Example of applicable products**

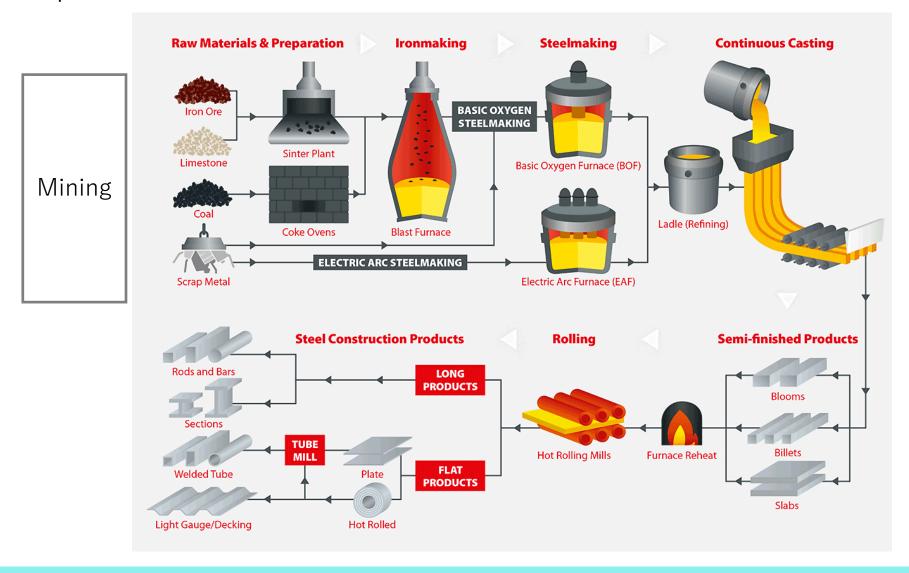


It depends on each vehicle design concept But we'd like to make agreement of common material classification

## **Example of Material process**



**■** Example of Steel



## **Following Discussion**



	Item
1	Steel Discussion
2	Aluminum Discussion
3	Copper Discussion
4	Resin Discussion
5	BATT. Material Discussion (Need to check EU BATT regulation)



## **End**