

OICA End-of Life methodology comparison

Advantages & disadvantages for CFF and cut-off criteria methods - proposal

Item	CFF		cut off	
	PRO	CON	PRO	CON
APPLICABILITY				
Complexity of the calculation / effort of application		Slightly higher effort	Easier application	
Complexity of the calculation / intuitive approach		Highly complex / deep understanding is required	Easy to explain	
Adaptation/implementation in automotive industry (inventories & databases)	-Upcoming CFF parameter data set for major Automotive materials (Steel, AL, Cu) in early 2024 for JPN, Ev, E*v, Erec, ErecEoL in IDEA database and A, R1, R2, Qsin/Qp, Qsout/Qp in JAMA LCA guideline data set. Japan only for the moment. International application for the future to be discussed. Europe's JRC existing as well. China? USA? IDEA requires licencing. JRC EF compliant is free.	Not applied in vehicle LCA yet except for EU BAT regulation. No database available yet for CFF which is e.g. covering necessary CFF parameters of all material flows involved in the bill of materials of lithium-ion batteries.	Applied in current vehicle LCAs. Database is available and currently in usage; GABI database requires licence fee	
Data maintenance effort	Above CFF parameter don't need specific update due to mature recycling technology basis Mature in Japan. To be confirmed for RoW ? JAMA to use current mature value for CFF calculation of future EoL	The CFF parameters should be updated yearly as e.g. LIB technology and recycling technology for LIB are still evolving. Feasible regional disaggregation to be defined ⌘ Evolution of scenario more or less difficult depending on the material	No specific updates necessary. Same rule for all regions.	
Suitability for longliving products (life span of a vehicle up to 15-20y)	-CFF can anticipate future decarbonization at EoL within automotive life cycle under appropriate future recycling scenario which is based on current established recycling technology and market trends. -As first step, CFF can be applied to steel, Al, Cu materials and LiB repurposing which is established in JPN (excluding battery material recycling) ⌘ scenario not compatible with primary data objectives related to level concept ⌘ Same methodology have to be applied to all materials ⌘ clarification needed to understand whether 2 methodologies can be applied depending on the material. To be seen with current verifying bodies. 1 answer: need to be consistent. Only one method Need more answers. See with ISO body	High disadvantage as the current recycling technology / system for LIB is not mature enough yet and CFF results are therefore strongly relying on a forecast of the future recycling processes. Risk of greenwashing accusation. Disadvantage for CFF diminishes in the future when technologies and recycling systems are expected to be settled. No data available yet for battery. ⌘ using different methodologies for different materials can lead to unfair treatment of recycler industry	Yes, because recycled material can be used directly at the begin of vehicle's production.	Risk due to not taking future Automotive EoL impact into account.

Reliance on disclosure of primary / region -specific data for future EoL processes to derive CFF parameters (e.g. A factor)	-Most of CFF parameter including A factor of steel, AL and Cu could be determined at the regional level. This is pending the verification whether they can be harmonized at a global level. Other materials recycling are more difficult to harmonize at a global level.	Currently: use of secondary data / unique "A" factors due to lack of primary /region-specific data disclosure. In future: use of primary data might be possible. (Development is required) Therefore: Difficult due to many materials streams Information not disclosed by recyclers because of confidentiality. Needs assumptions on processes that do not exist at the time when LCA is performed, hence provided credits for emissions reductions which are in the far future and partly uncertain	EoL process data / insight is not needed for allocation	
INCENTIVISATION				
Circular economy incentives linked to decarbonization	Encourages the use of high quality recyclable material	Disadvantages for using recycled materials compared to cut-off approach. CFF gives an incentive to recycle high-quality material after use.	Encourages the use of recycled materials	Disadvantages for using recyclable materials compared to CFF approach.
Future perspective	Using CFF could be of advantage once recycling processes / wider circular economy are well established in all regions. And respective database are available (see above comments)		High feasibility for cross-sectoral carbon accounting. Avoidance of double counting of recycling benefits	
Promoting principles	-Promoting and support new business in terms of wider circular-economy, specifically recycling industry in a global and cross industries level, no matter where the material or the parts ends up by taking into account the credit of end-of-life scrap and burden of recycled material or parts input, using generic A factor.		Promoting decarbonization of primary produced material (Blast Furnace route steel from iron ore, primary aluminium from bauxite ore). Since Automotive industry uses many primary sourced metal, cut-off method takes 100% burden as for input material and no credit for recyclable material, this incentivizes the primary production routes to get better. Promotes the efficient use of primary material (reduce cuttings and clippings). Promotes the thorough / sorting of clippings / pre-consumer scrap.	-No credit for recyclable material, -Not anticipate future Automotive EoL recycling impact especially for Parts recycling
EFFECT ON CFP				
Boundary conditions		Intrinsic complexity of the formula does prevent other industries to use consistent factors	Enables a lean and consistent cross sectorial carbon accounting	
Consequence on results of overall LCA	Lower GWP compared to cut-off		Higher GWP compared to CFF. Cut off approach is more conservative due to no credits for potential future recycling unknown at the moment of sales. More transparent approach towards Environmental NGOs	

