Reconciling recycling at production stage and end of life stage in EN 15804: the case of metal construction products

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What is METALS FOR BUILDING alliance?

- It unites ten European or International metal associations
- It represents the interests of the metal industry to European institutions and promotes the sustainability and recyclability of metals in the building sector.

EUROFER The European Steel Association

EUROPEAN ALUMINIUM

European Copper Institute Copper Alliance

International Zinc Association Zinc...essential for modern life

EGGA European General Galvanizers Association

EUROMETAUX EUROPEAN ASSOCIATION OF METALS

Nickel INSTITUTE knowledge for a brighter future

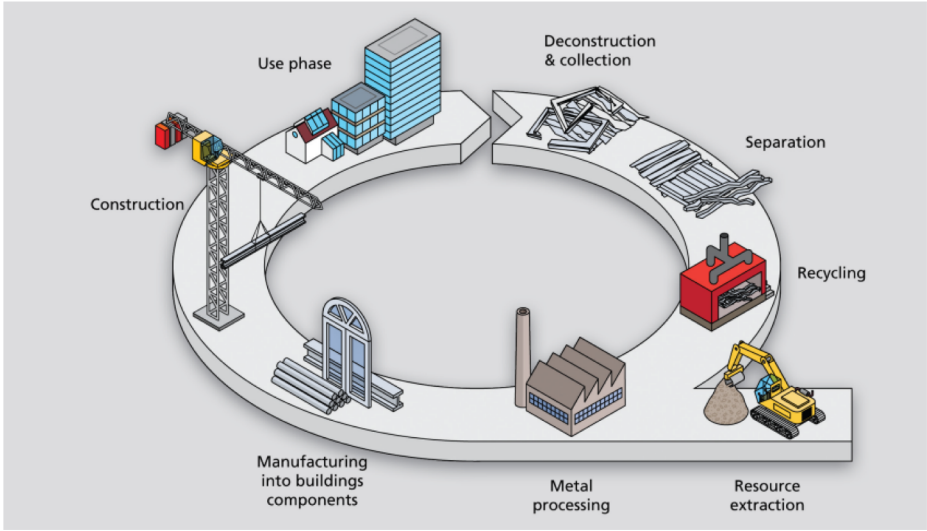
European Association for Panels and Profiles

FAECF Federation of European Window and Curtain Walling Manufacturers' Associations

ecca prepaintedmetal.eu

Metals in Buildings strongly support the circular economy

- High end of life recycling rate: More than 95% of metals used in buildings are specifically collected and recycled at the end of life
- High economic value for systematic dismantling, collection and recycling.
- Energy savings comprised between 60% and 95% compared to primary metal production

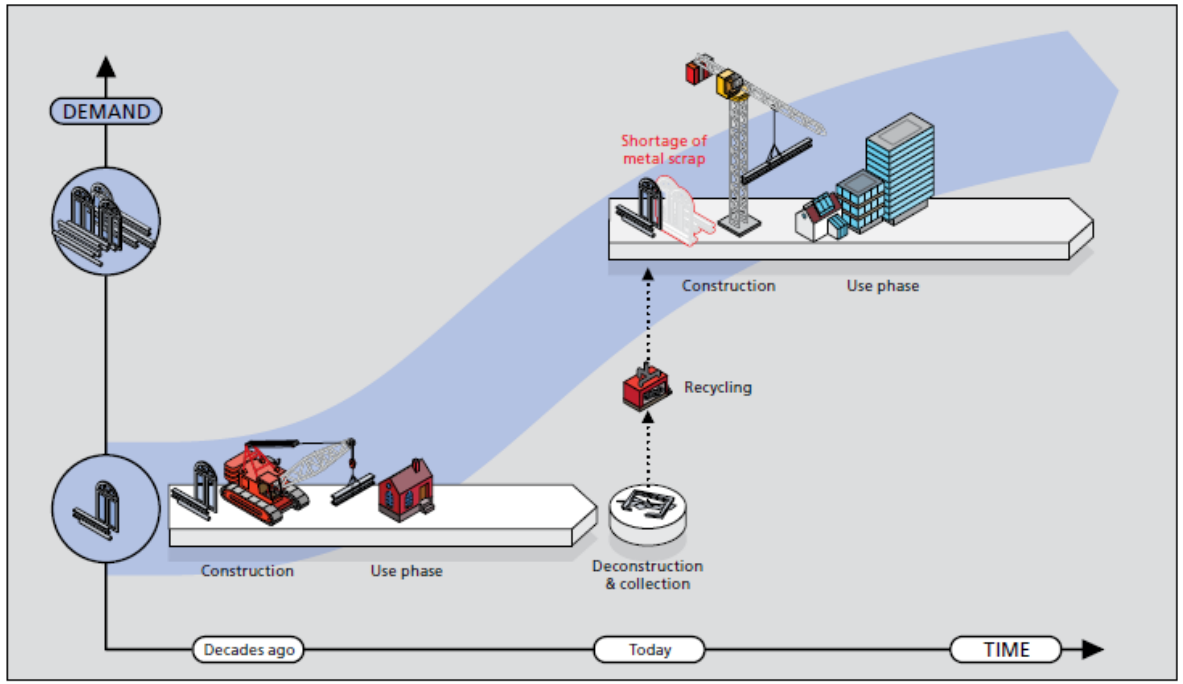


Mixed metal scrap

Aluminium ceiling strips in the Pirelli building

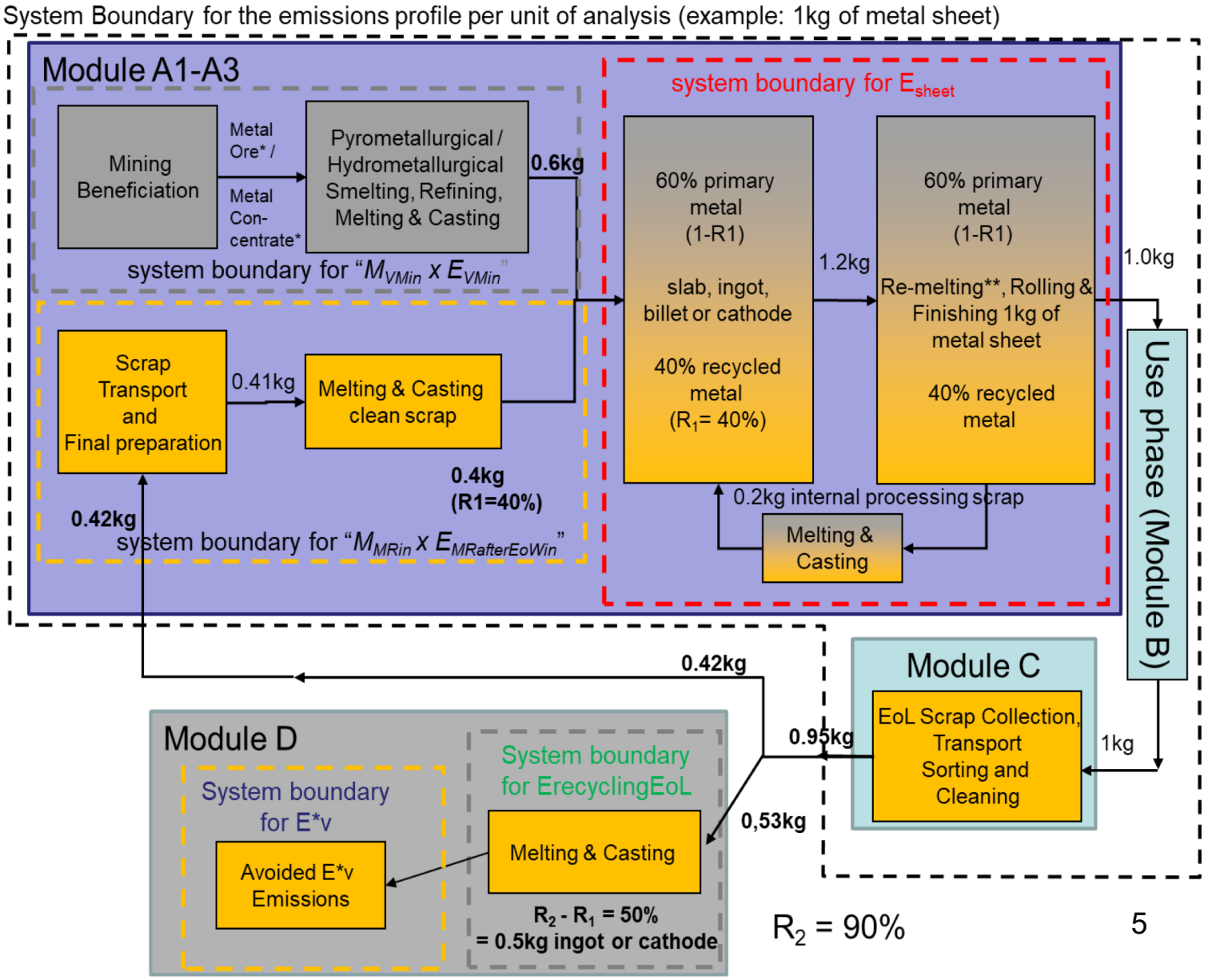
The End of Life Recycling Rate >> %Recycled Content

- Today, %RC is limited by the metal scrap availability coming from products with decades of service life and due to the market growth.
- The average recycled content in metal supply is significantly lower than the end of life recycling rate because decades ago less metals have been used.
- Module D addresses this complexity and is an essential part of the LCA/EPD of metal building products



Example for 1 kg of metal sheet

- Module D shall address only the net quantity of scrap generated by the product system,
- e.g. 0,53 kg among 0,95 kg collected for end of life recycling



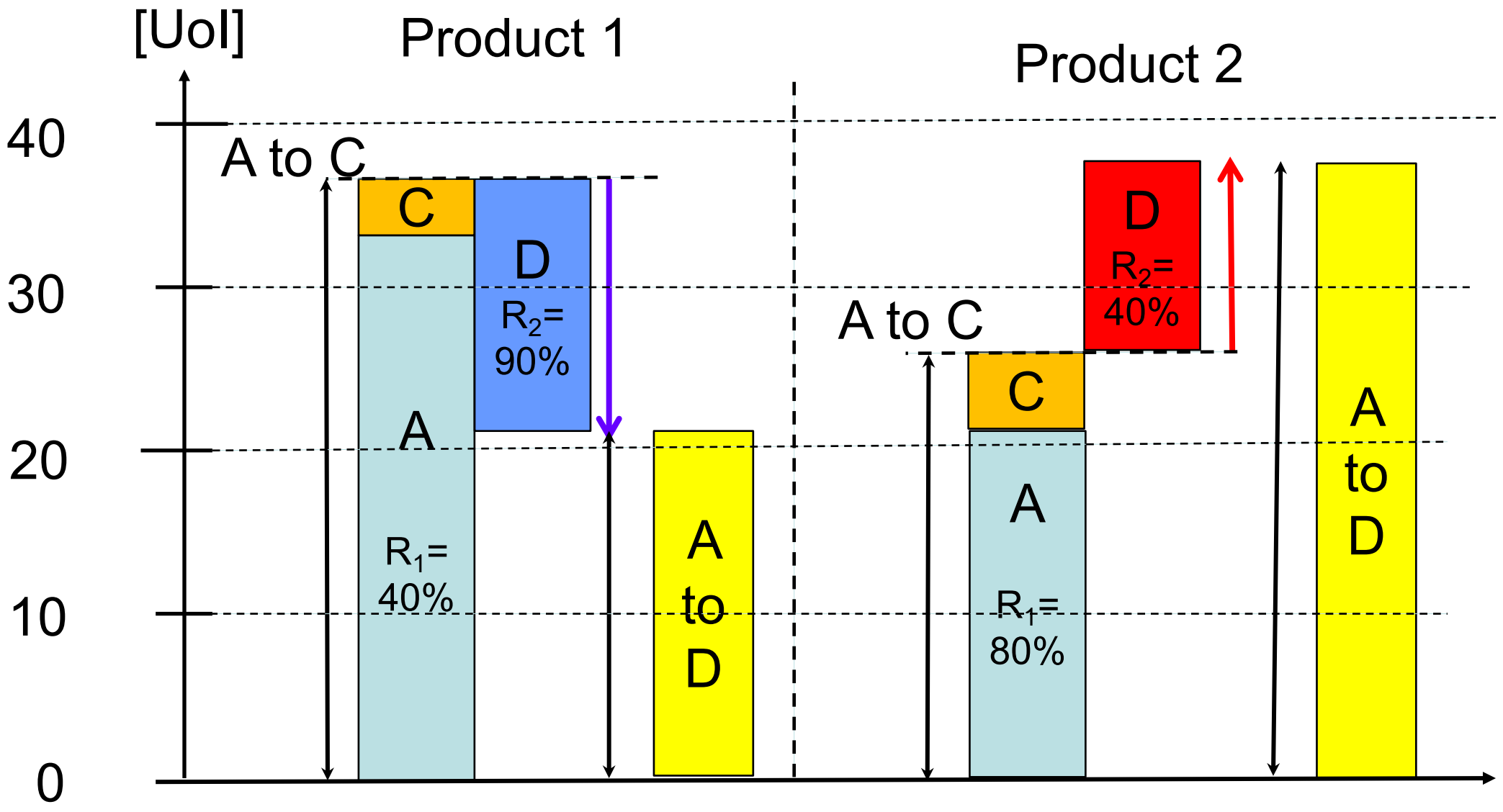
Alu and steel average LCI datasets for potential use in EN15804

Module	Formula in EN 15804	Metal datasets corresponding to EN 15804 formula terms assuming 1kg sheet product	
		Aluminium	Steel
A	$M_{VM\ in} \cdot E_{VM\ in}$ + $M_{MR\ in} \cdot E_{MR\ after\ EoW\ in}$	R_1 x [wrought ingot from pre-consumer scrap or clean post-consumer scrap] + (1-R_1) x [primary ingot produced (or used) in Europe - cradle to gate] + [sheet produced from wrought ingot]	Aggregated cradle to gate LCI for 1kg steel sheet containing recycled and primary steel e.g. “Cold rolled coil” or “Continuous Hot Dip Galvanised coil”
D	$(M_{MR\ out} - M_{MR\ in}) \left(E_{MR\ after\ EoW\ out} - E_{VMSub\ out} \cdot \frac{Q_{R\ out}}{Q_{Sub}}\right)$	(R_2-R_1) * ([ingot from post-consumer scrap] - [primary ingot produced (or used) in Europe - cradle to gate])	$(M_{MR\ out} - M_{MR\ in})$ * [Value of scrap LCI], i.e. LCI result using 100% scrap based EAF slab minus theoretical 100% primary slab.

Calculation for 3 theoretical products

Parameters and process	Module A				Module C		Module D		
	R_1	E_v	$E_{recycled}$	E_{sheet}	C3	C4	R_2	$E_{recylingEoL}$	E_v^*
Unit	%	[UoI]	[UoI]	[UoI]	[UoI]	[UoI]	%	[UoI]	[UoI]
P1	40%	40	10	5	2	1	90%	10	40
P2	80%	40	10	5	2	3	40%	10	40
P3 - scenario A - closed loop	80%	30	20	0	4	1	80%	20	30
P3 - scenario B - open loop	80%	30	20	0	2	1	80%	5	10

Results for products 1 & 2



Module A

$(1-R_1).E_v+R_1.E_{recycled}+E_{sheet}$

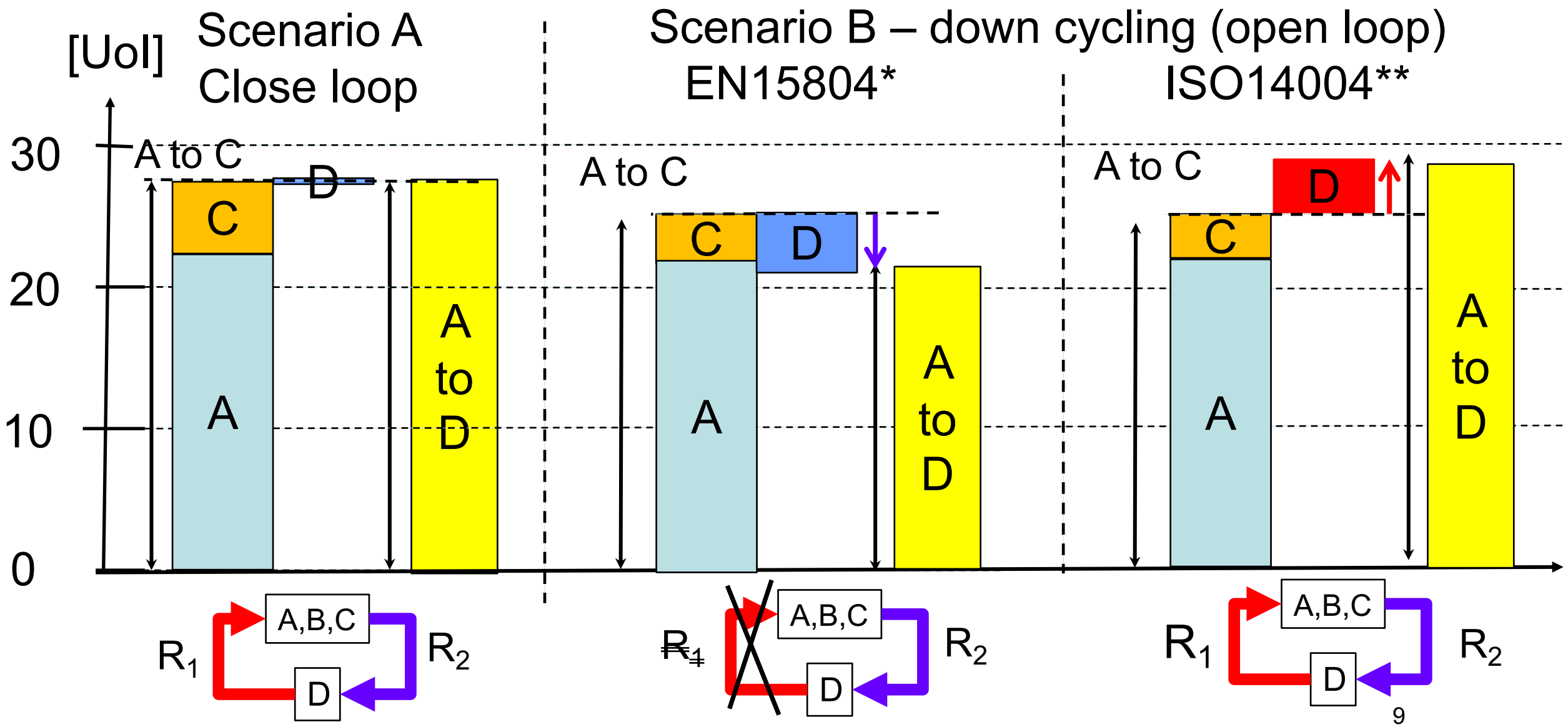
Module C

C3+C4

Module D

$(R_2-R_1)\cdot(E_{recyclingEoL}-E_v^*)$

Results for Product 3 - R_1= 80% & R_2= 80%



*R_1 is **not** necessarily considered for the net flow calculation of Module D, **R_1 is considered for the net flow calculation of Module D

Conclusions

- Module D is an essential part of assessing the life cycle of metal building products
- For **similar types/qualities of secondary materials entering and exiting** the product system, e.g. in case of close loop recycling like it is the case for metals, **the net flow of secondary materials shall be used in Module D to avoid double crediting** as required in ISO14044,
- For **dissimilar types/qualities of secondary materials entering and exiting the product system,** e.g. in case of open loop recycling or downcycling, **entering flows could be omitted** generating misleading results based on double crediting of recycling. This is in contradiction to ISO14044 and creates discrimination against close-loop recycling
- The metal industry recommends to address this issue in a next revision to secure a more robust module D calculation methodology, fully in line with ISO14044