

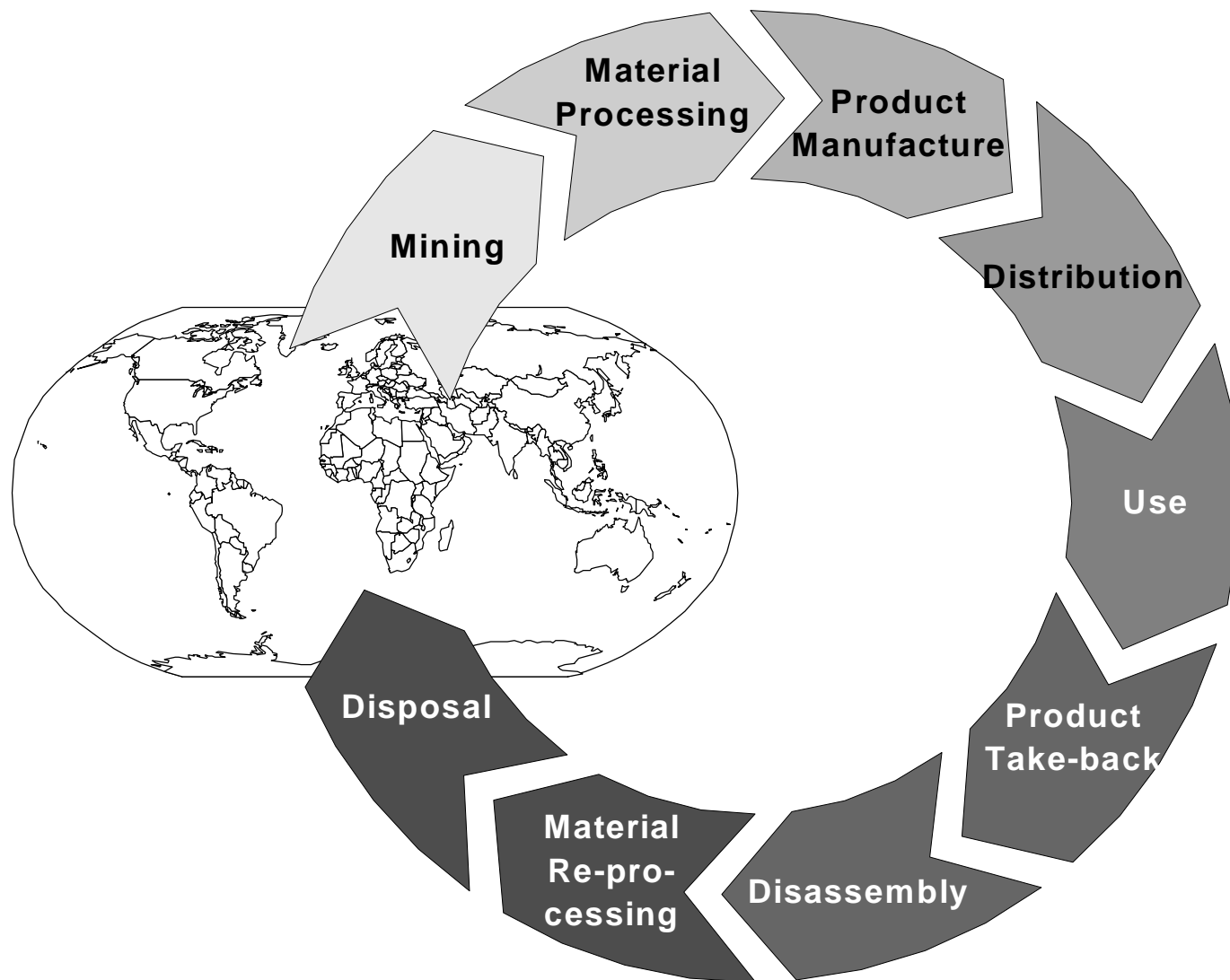
The importance of LCA in the framework of sustainability

Prof. Dr. Ir. Wim Dewulf
K.U.Leuven – Mechanical Engineering Department &
Group T – International University College Leuven

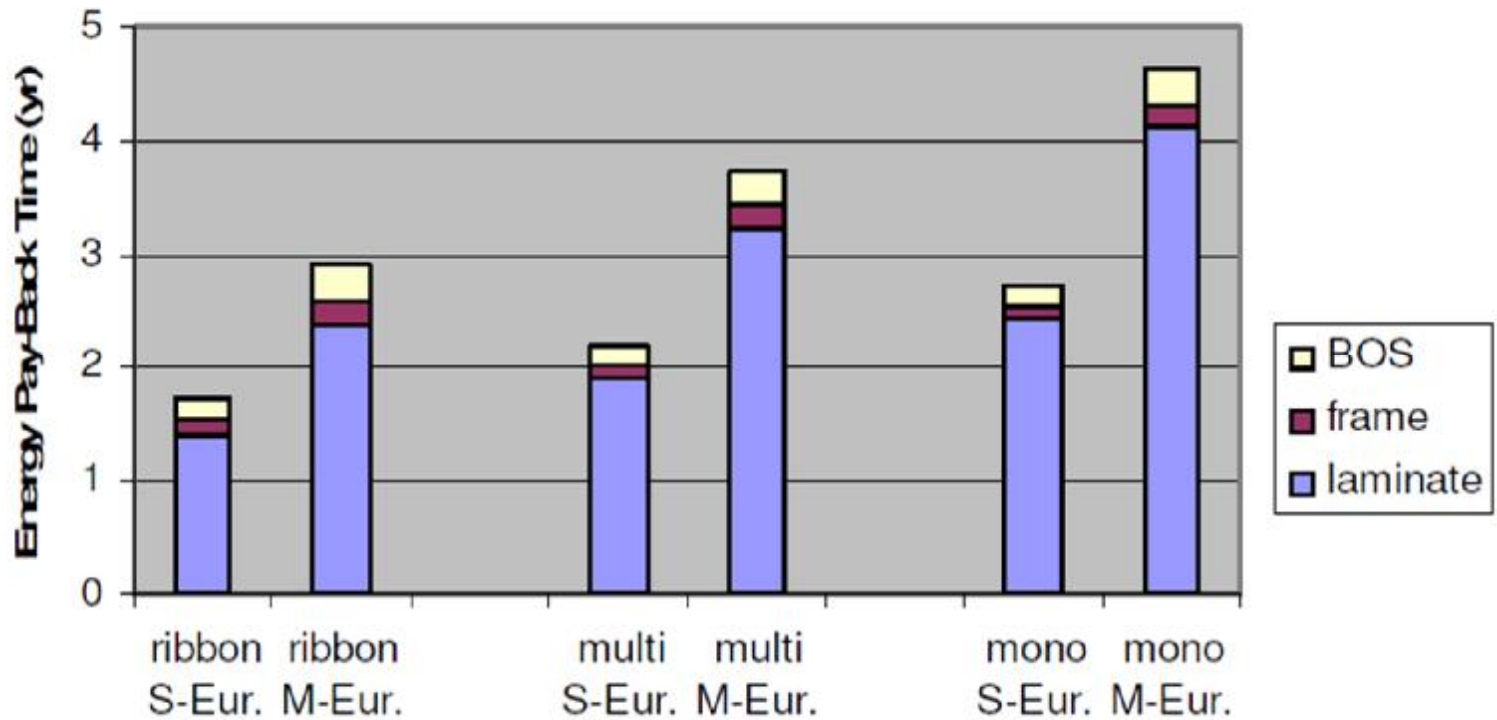


The image shows the cover of the EPBA Sustainability Report 2010. It features a blue background with three photographs: two hikers looking at a map, a stack of colorful batteries, and a child looking through a magnifying glass. The text on the cover reads: "EPBA SUSTAINABILITY REPORT 2010", "Looking back, looking ahead", and "Past achievements, ongoing efforts and future perspectives of the European battery industry".

36	9. SUSTAINABILITY PROGRESS
37	+ Life cycle analysis
37	- Duracell study
39	- Energizer study
41	+ Market trends







Source: Erik A. Alsema, Mariska J. de Wild-Scholten, *Environmental Impacts of Crystalline Silicon Photovoltaic Module Production*, in: Duflou J., Dewulf W. (Eds.), *Proc. Of LCE2006, Leuven, May 31st-June 2nd, 2006*.



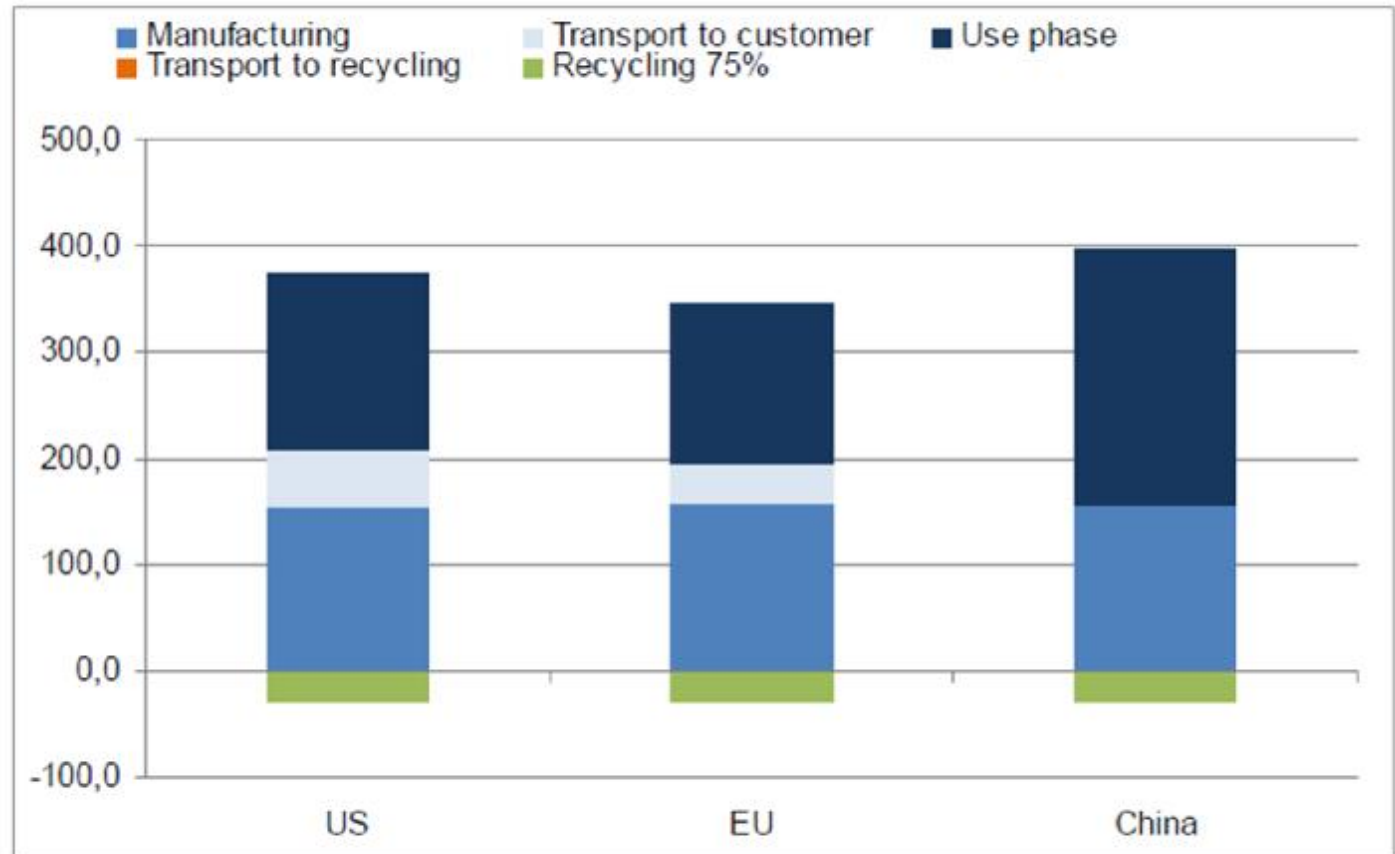


Fig. 2: Total Product Carbon Footprint [kg CO₂e] of the E6400 laptop in the three regions.

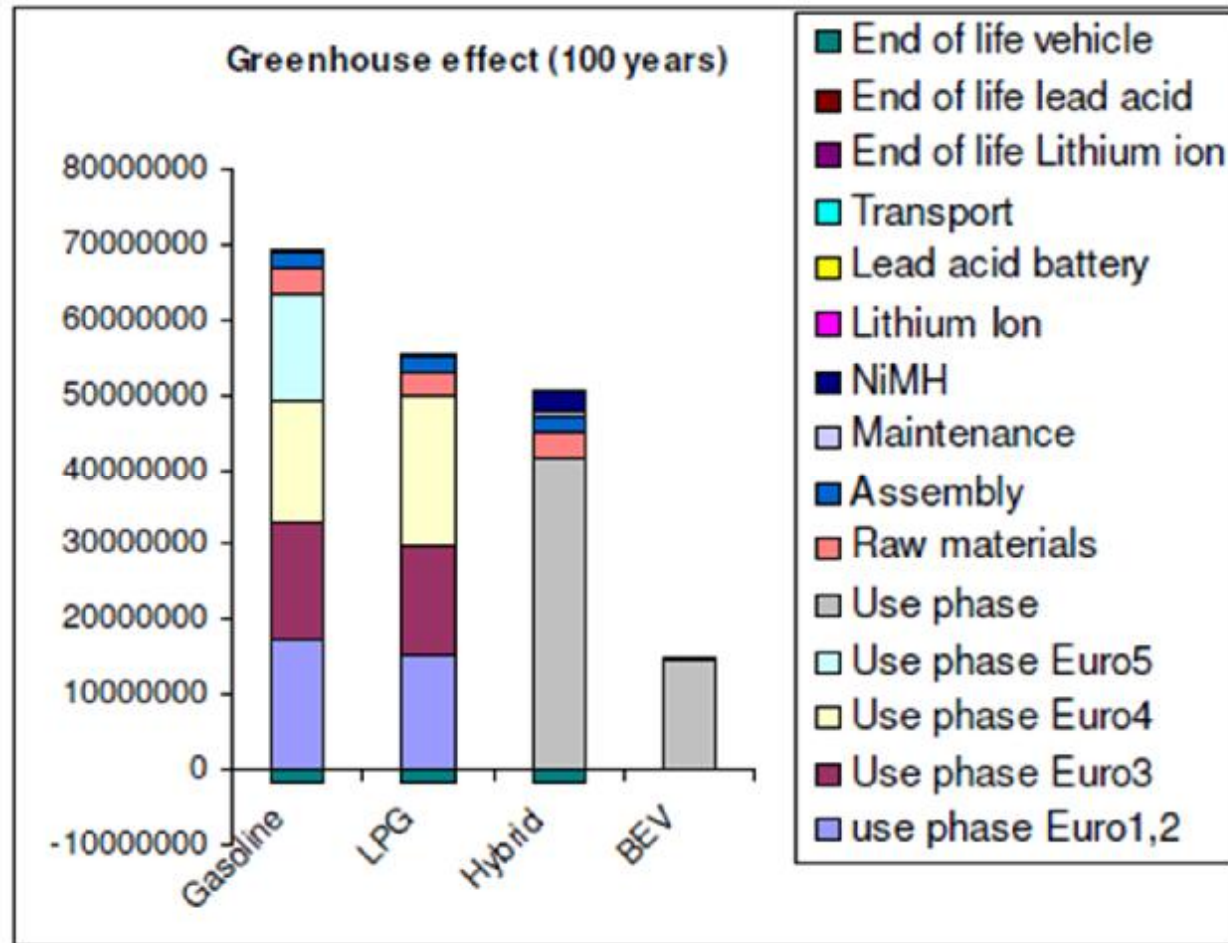
Source: M. Stutz, T. Moriarty, *Product Carbon Footprint (PCF) Assessment of Dell Laptop – Results and Recommendations*, Care Innovation 2010.



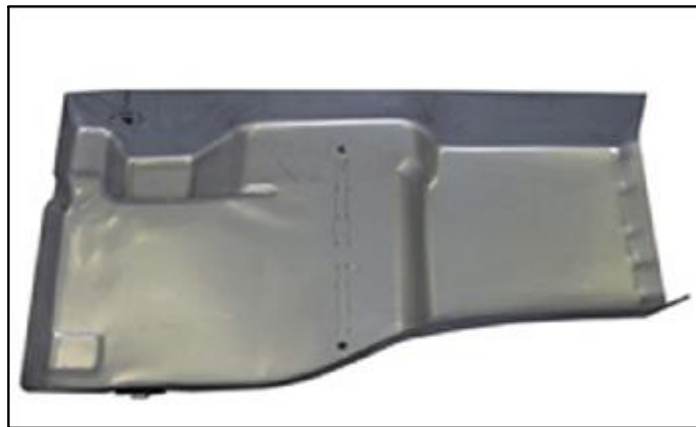
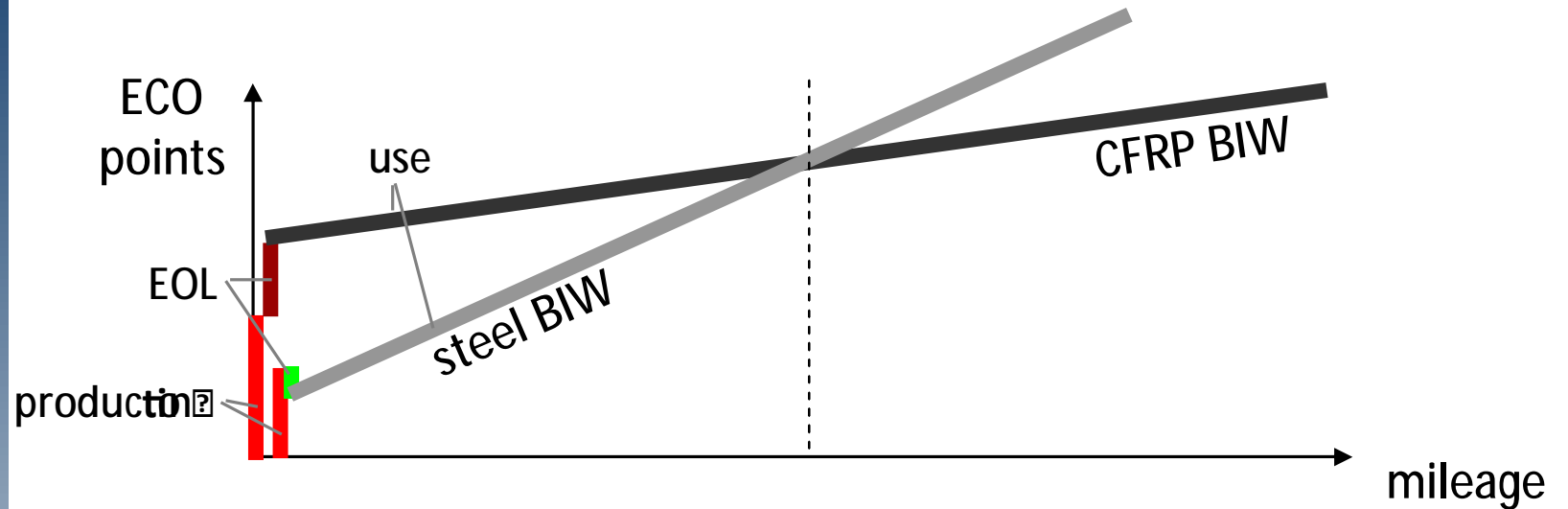
DIRECTIVE 2000/53/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 18 September 2000
on end-of life vehicles
(OJ L 269 , 21.10.2000, p. 34)



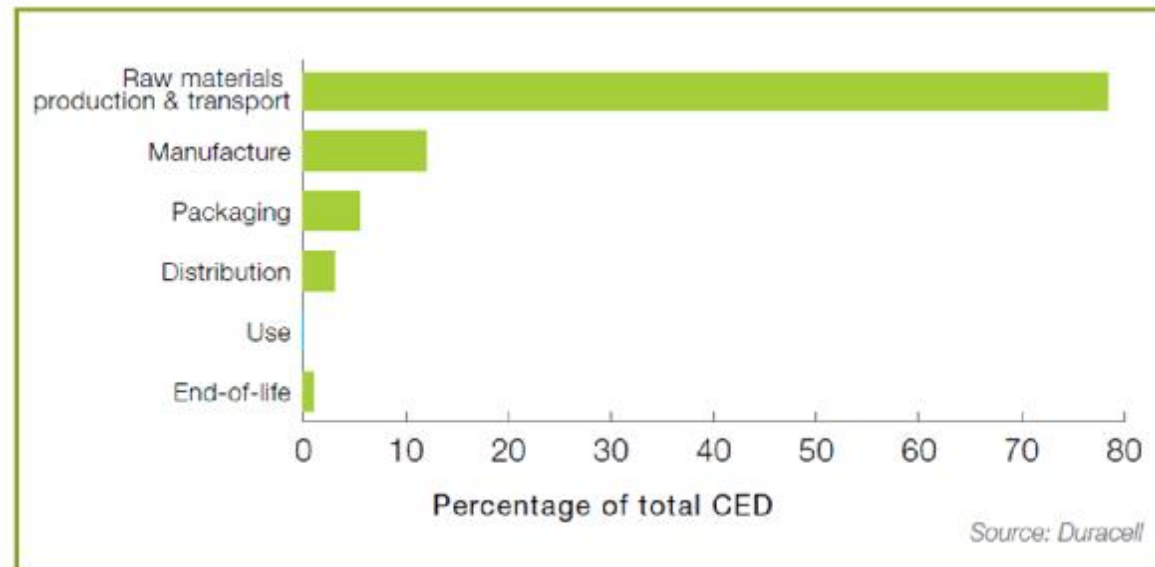
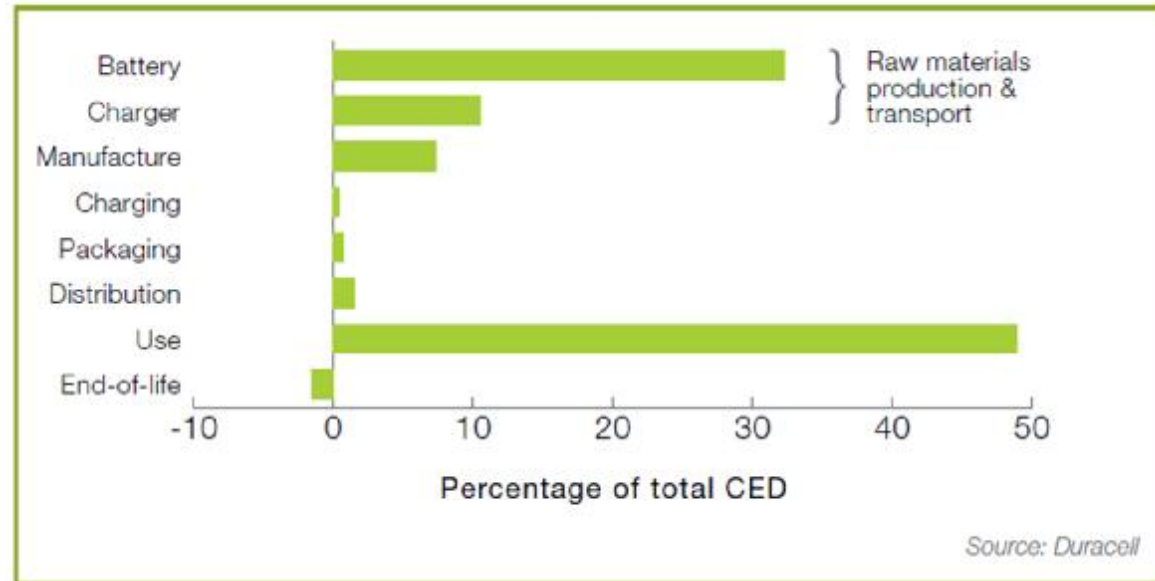
Picture source: <http://www.drasties.com>



Source: Boureima et al., Comparative LCA of electric, hybrid, LPG and gasoline cars in Belgian context, EVS24, Stavanger, Norway, May 13-16, 2009

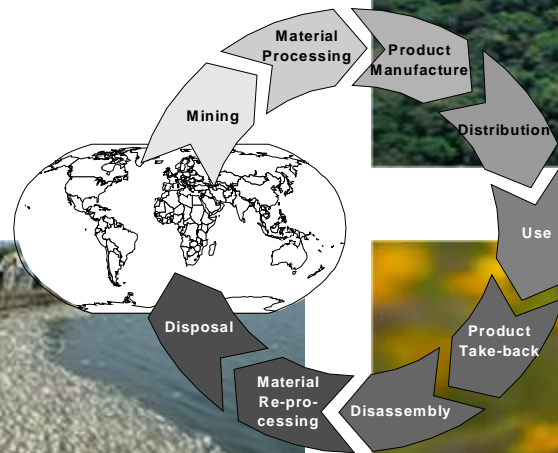


Source: Van Acker, Verpoest, De Moor, Dewulf and Duflou, *Lightweight materials for the automotive: environmental impact of the use of composites*, 3rd International Seminar on Society & Materials, SAM3, Freiberg, 29-30 April 2009



Source: EPBA Sustainability Report 2010

- Resource depletion
- Human health
- Ecosystem quality



E. LECLERC WATTRELOS
POINT ACCUEIL
TEL : 03.20.20.99.99
BONJOUR,

Caisse 040-0090 18 avril 2008 17:08
Ticket 18/04/08 0 1547 05200



* BLANC DE POULET	1.58
* SAUCISSES	1.39
* YAOURT VANILLE	2.50
* GÂTEAU	1.83
* MOUTARDE	1.82
* PUR JUS D'ORANGE	1.60
NETTOYANT CUISINE	1.70
COLORATION CHEVEUX	11.10
DENTIFRICE	1.10
<hr/>	
Total 9 articles	24.12
Soit en franc : 158.22	
(1 euro = 6,55957 francs)	
Esperes	24.12
Recu	0

MERCI
DE VOTRE CONFIANCE
A BIENTOT !

Le bilan CO₂ de mes courses est de :

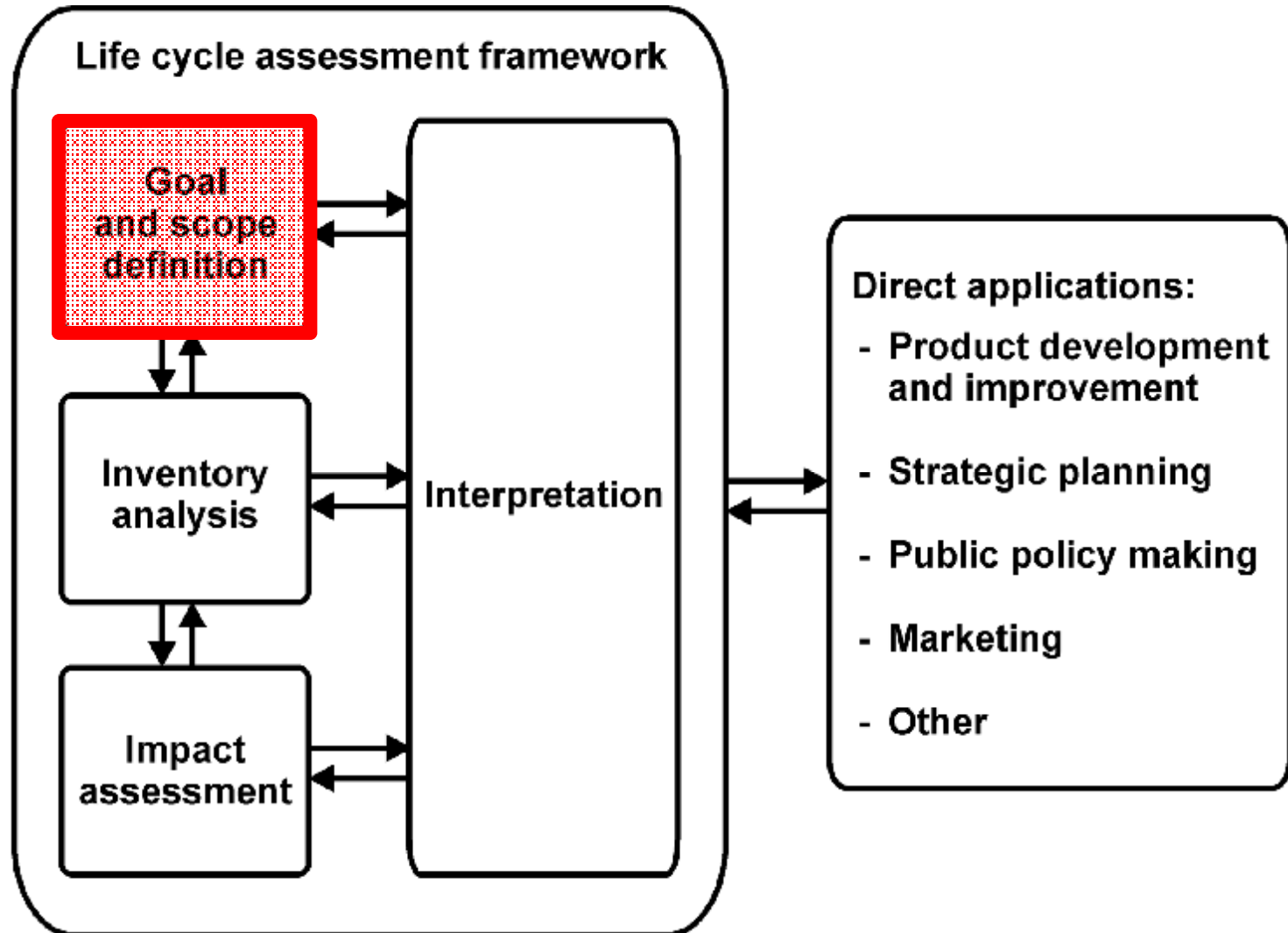
13,38 kg eq CO₂⁽¹⁾

Plus le chiffre est faible, mieux
c'est pour ma planète !!

Pour en savoir plus, RVV sur le stand à l'entrée
du magasin ou sur le site
www.jeconomisemaplanete.fr

(1) Ce chiffre correspond au total des émissions de gaz à effet de serre en équivalent CO₂ des produits indiqués par une étiquette dans le cadre de mes achats.





- Why?
- For whom?
- Which methodology?
- Which assumptions?
- ...

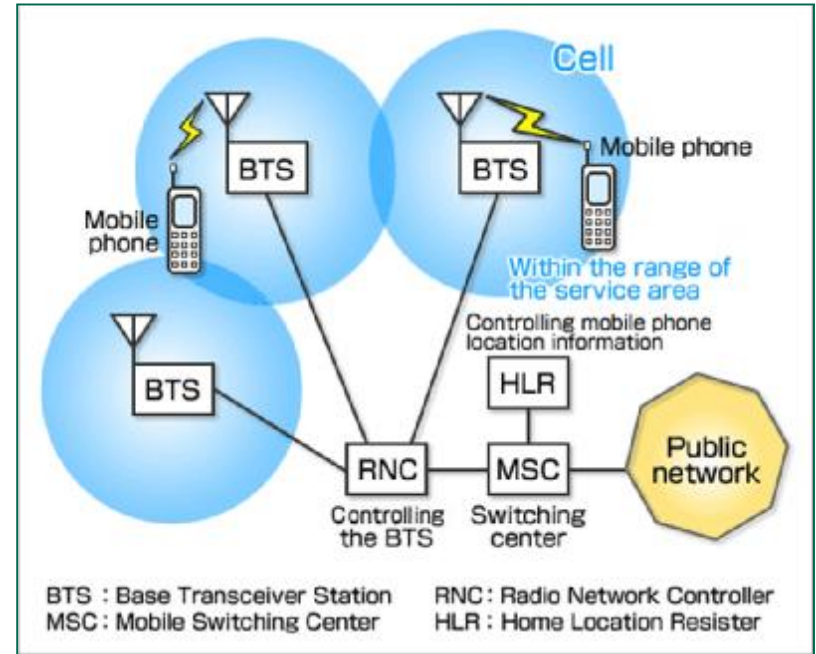
- Functional unit:

E.g. Paint

Cover and protect an surface of 1 m² during 5 years



G3 mobile phone
life cycle
14 kg CO₂








G3 mobile phone system
per subscriber per year
55 kg CO₂

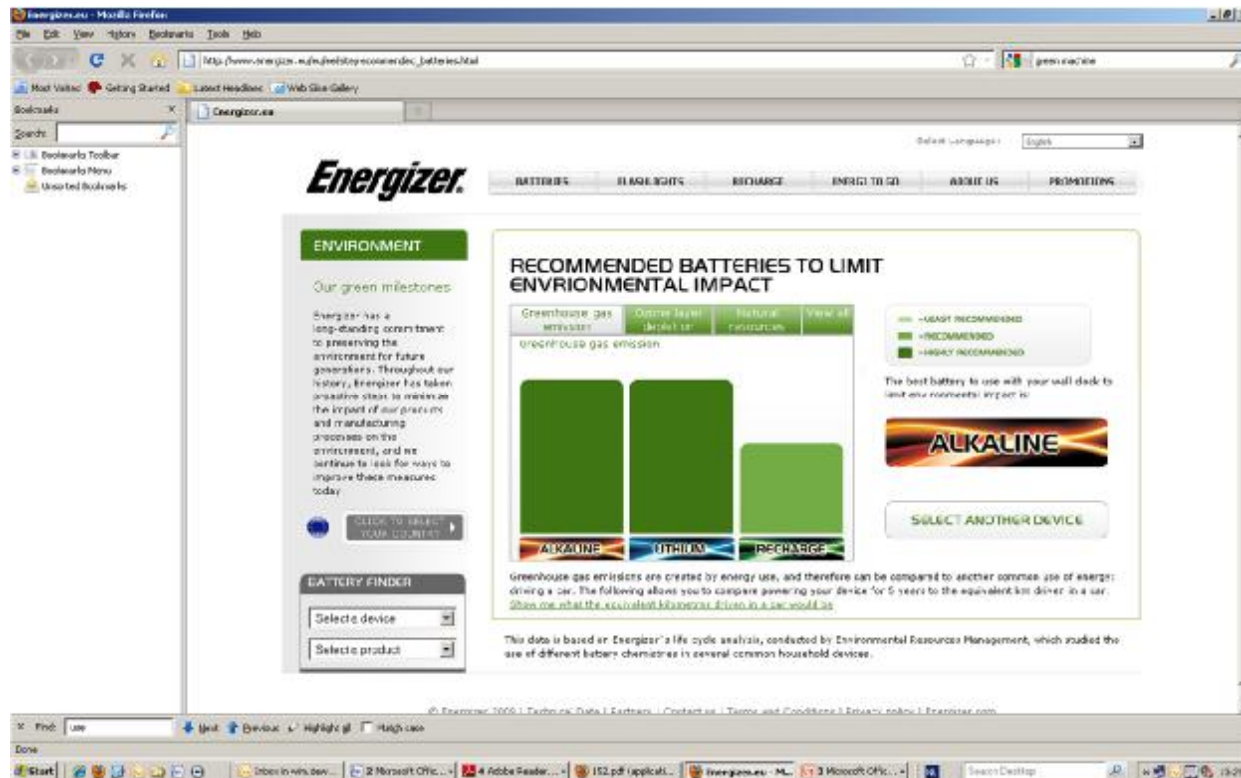
Data source: Integrated Product Policy Project – Stage I Final Project – Life Cycle Environmental Issues of Mobile Phones, 2005.

- Equivalence of functionalities?

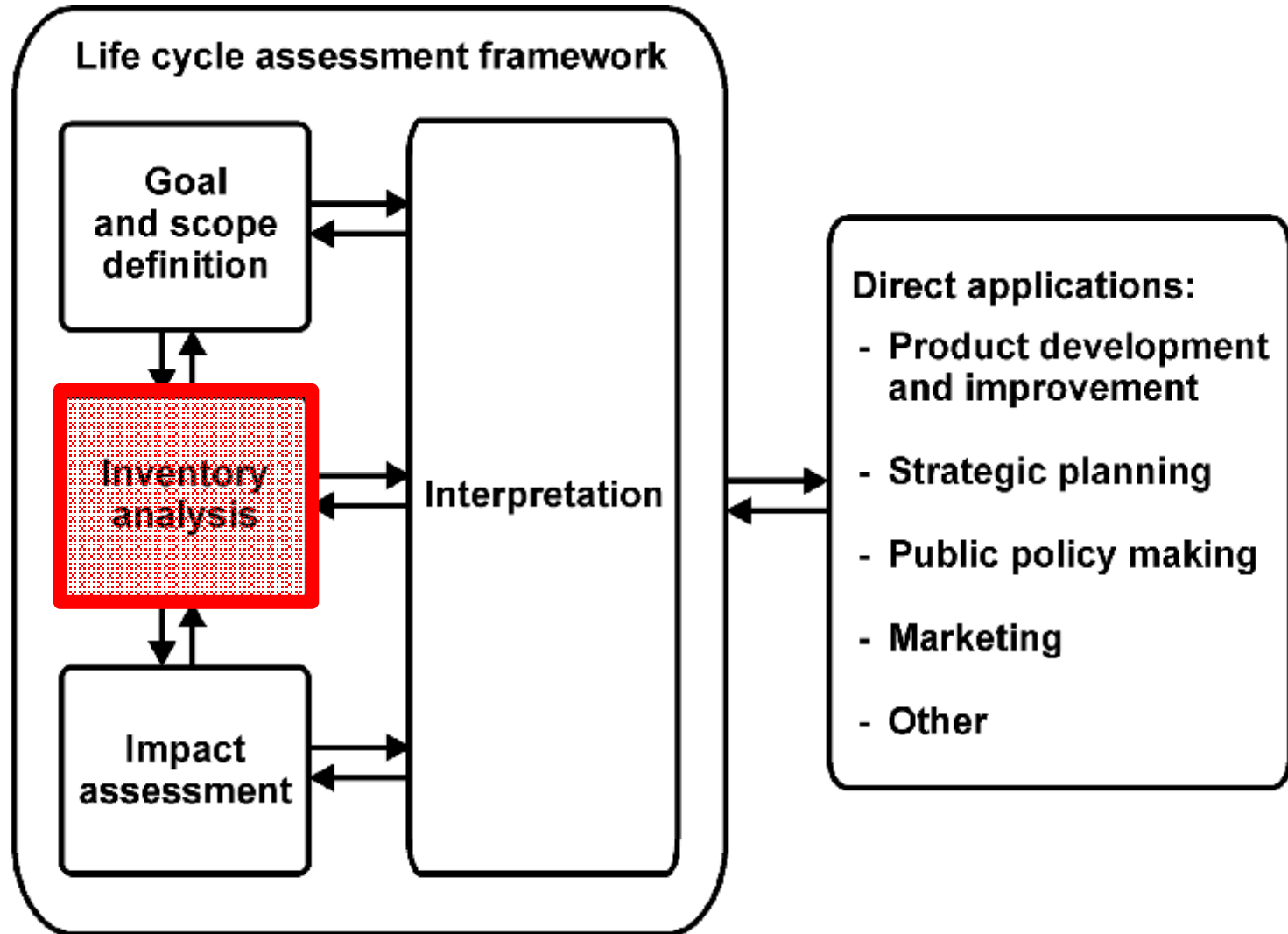


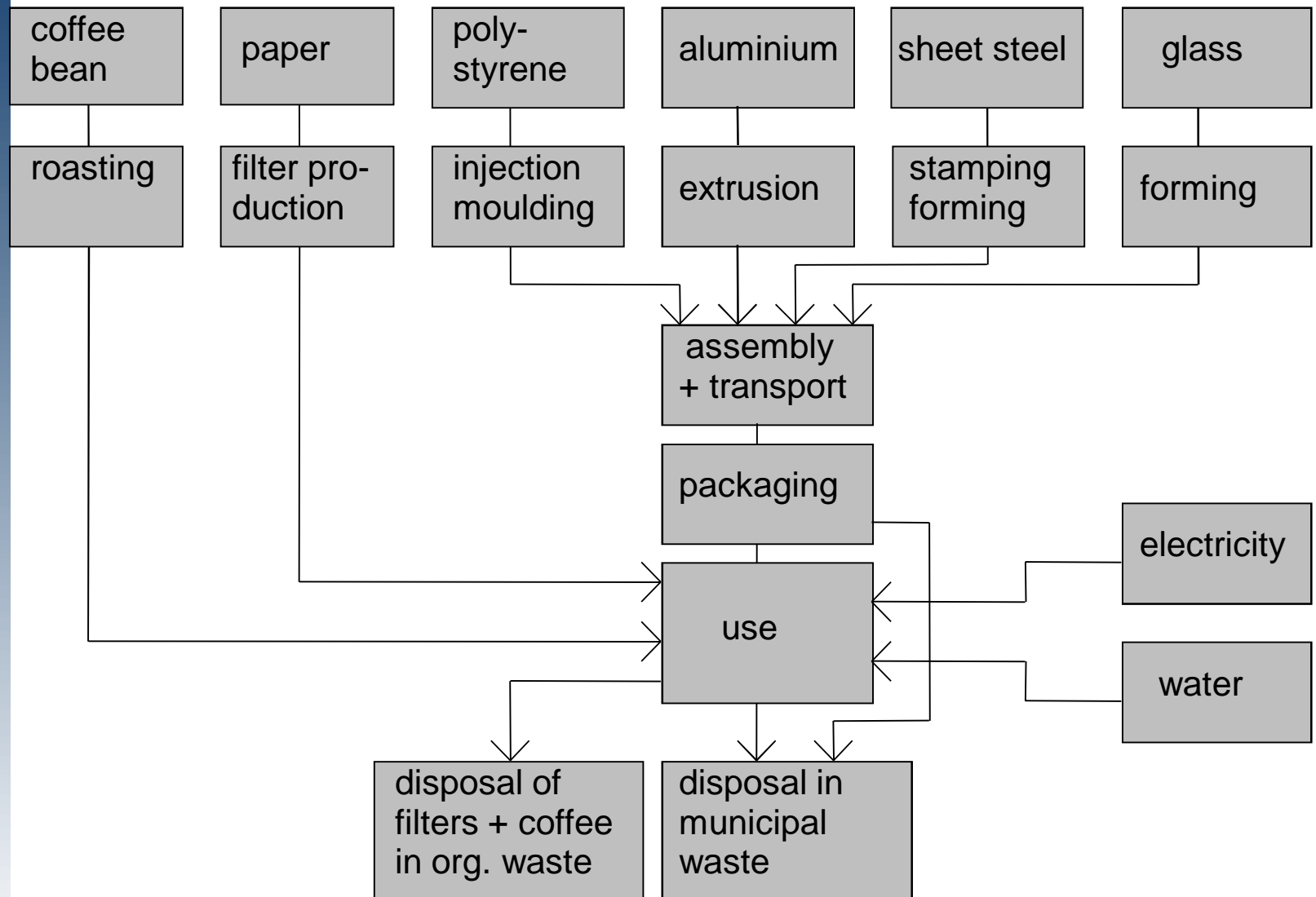
on the back of the blister pack of new ENERGIZER products

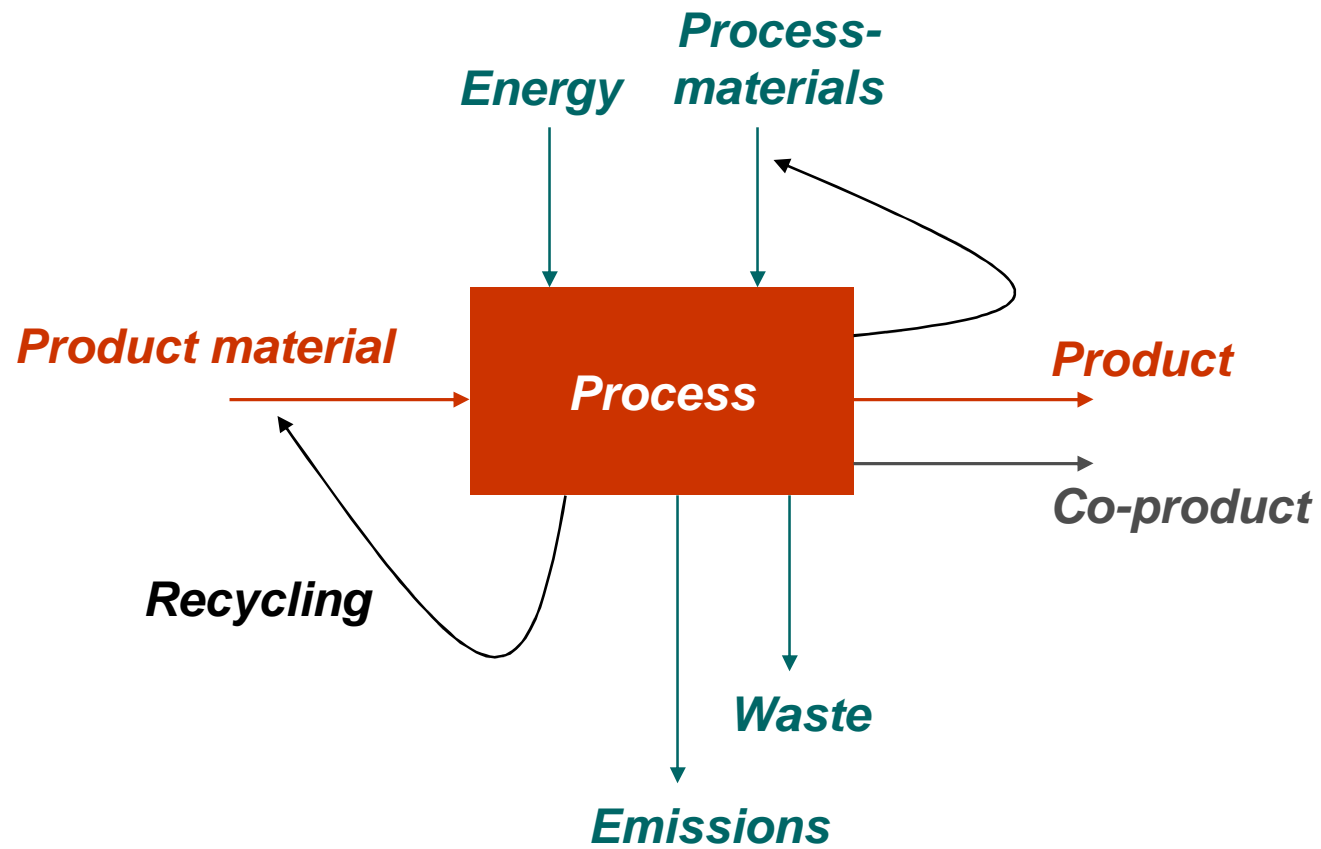
ECO INFO		USAGE		OCCASIONAL	REGULAR	INTENSIVE
 RECYCLED PACKAGING EMBALLAGE RECYCLE 95% REZYCLIERTE VERPACKUNG www.energizer.eu/ecoinfo	LOW			✓	✓	✓
	MEDIUM			✓	✓	ENERGIZER HIGH TECH



The screenshot shows the Energizer website with a focus on environmental impact. The main heading is "RECOMMENDED BATTERIES TO LIMIT ENVIRONMENTAL IMPACT". Below this, there is a bar chart comparing greenhouse gas emissions for Alkaline, Lithium, and Rechargeable batteries. The Alkaline battery has the highest emissions, followed by Lithium, and Rechargeable has the lowest. A legend indicates that Alkaline is "NOT RECOMMENDED", Lithium is "RECOMMENDED", and Rechargeable is "HIGHLY RECOMMENDED". The website also features a "BATTERY FINDER" tool and a "SELECT ANOTHER DEVICE" button.







PlasticsEurope
Association of Plastics Manufacturers

worldsteel
ASSOCIATION

euca european
aluminium association

**Deutsches
Kupferinstitut**



Source: <http://www.inhabitat.com>



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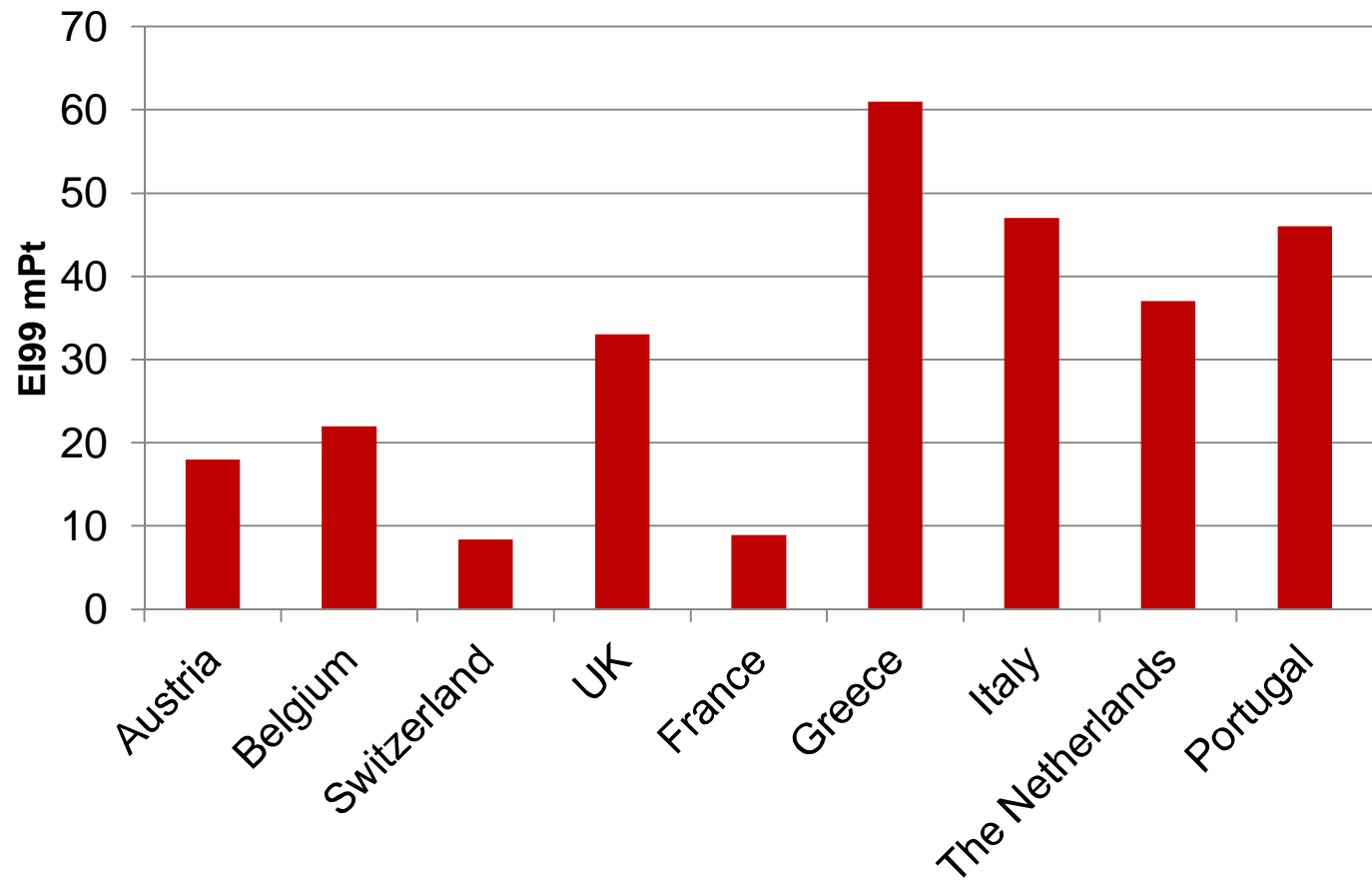
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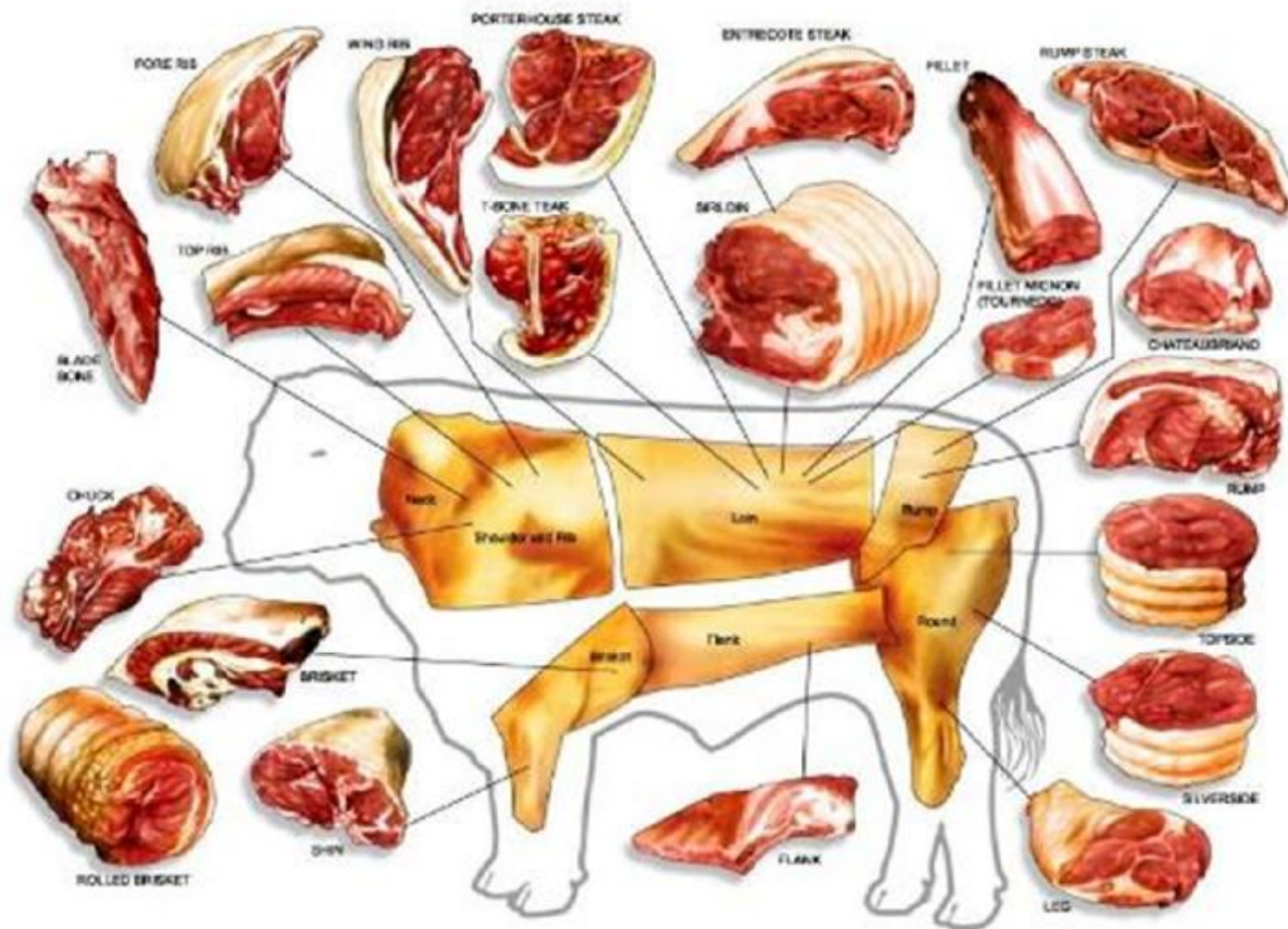
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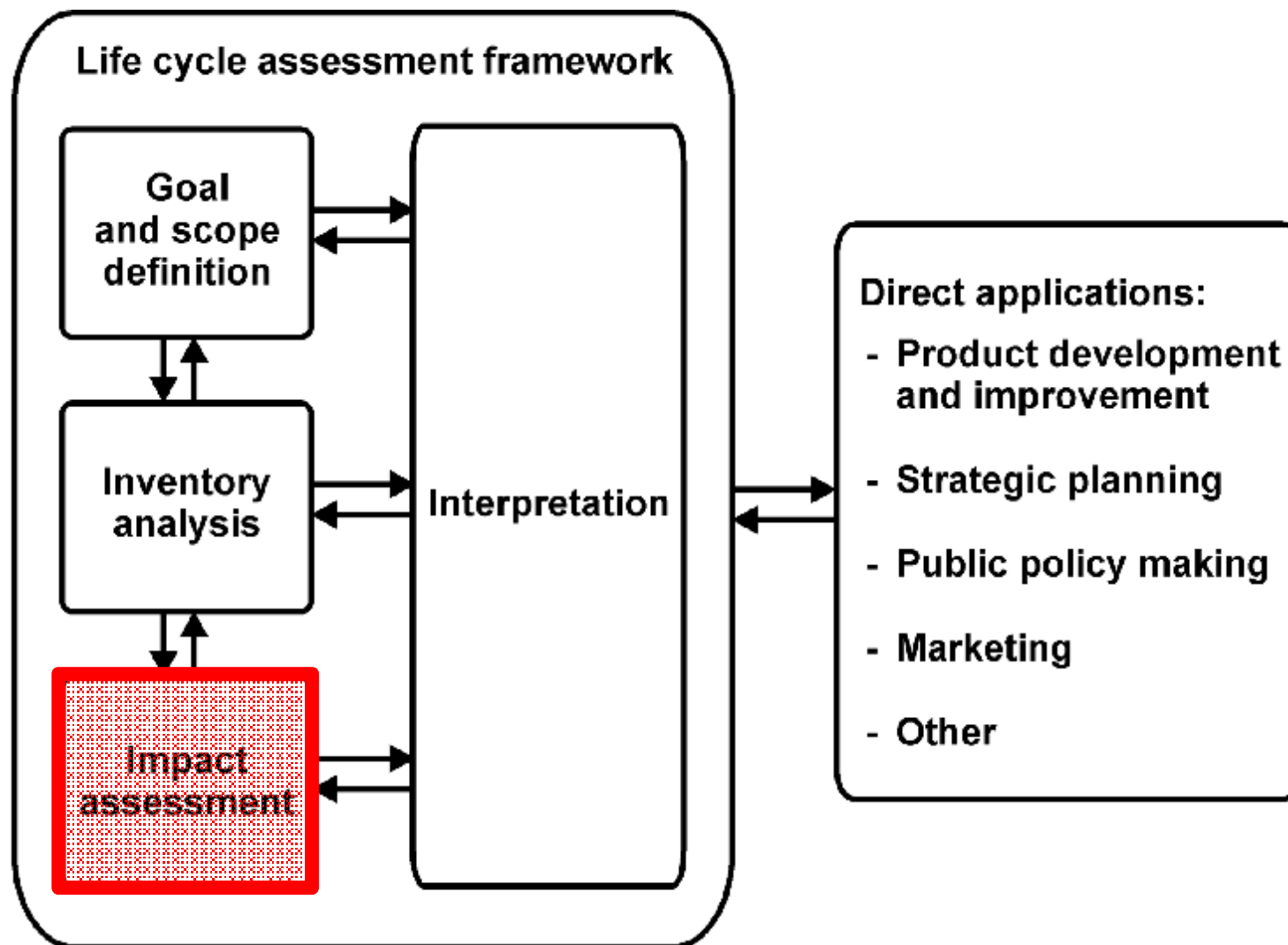
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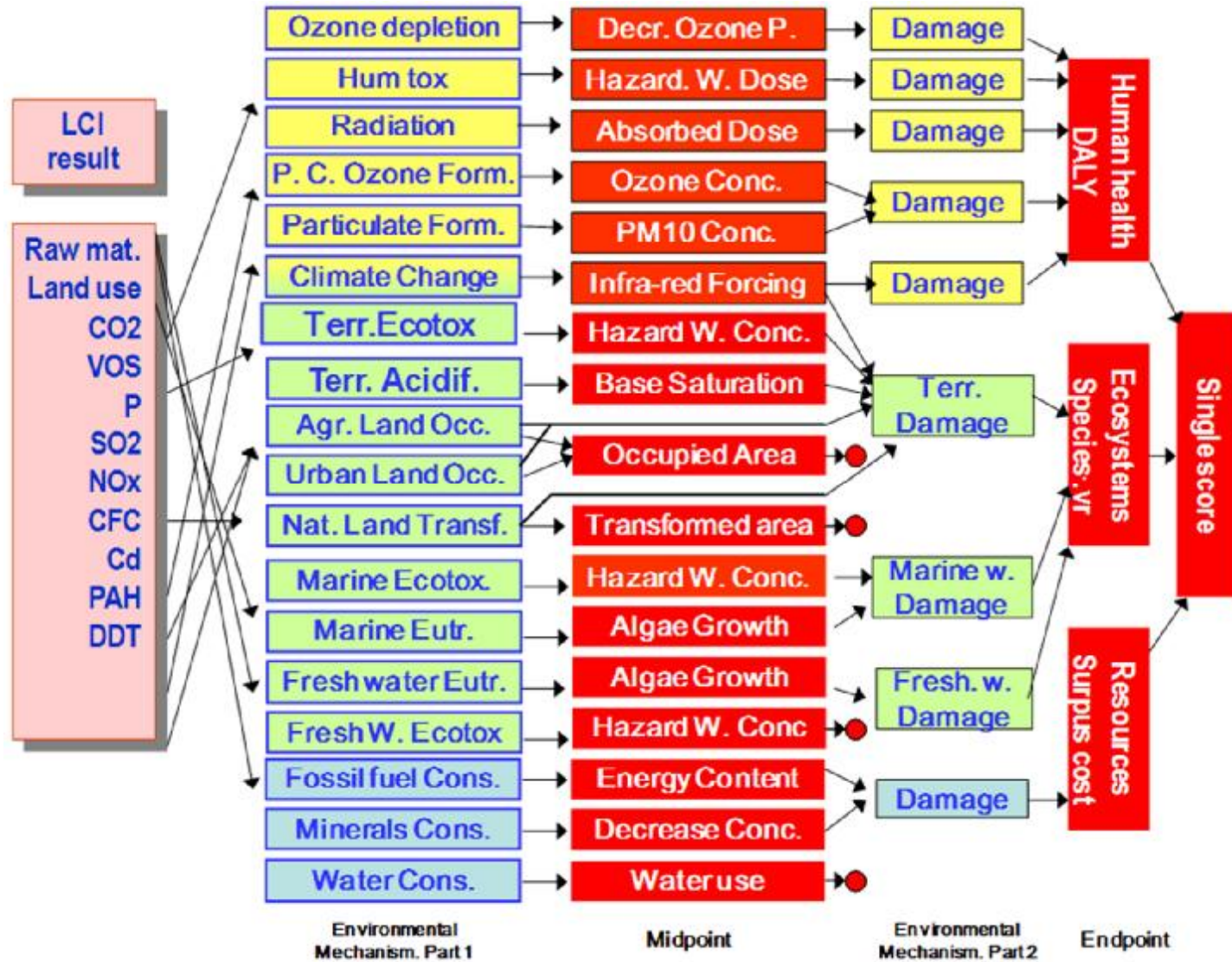
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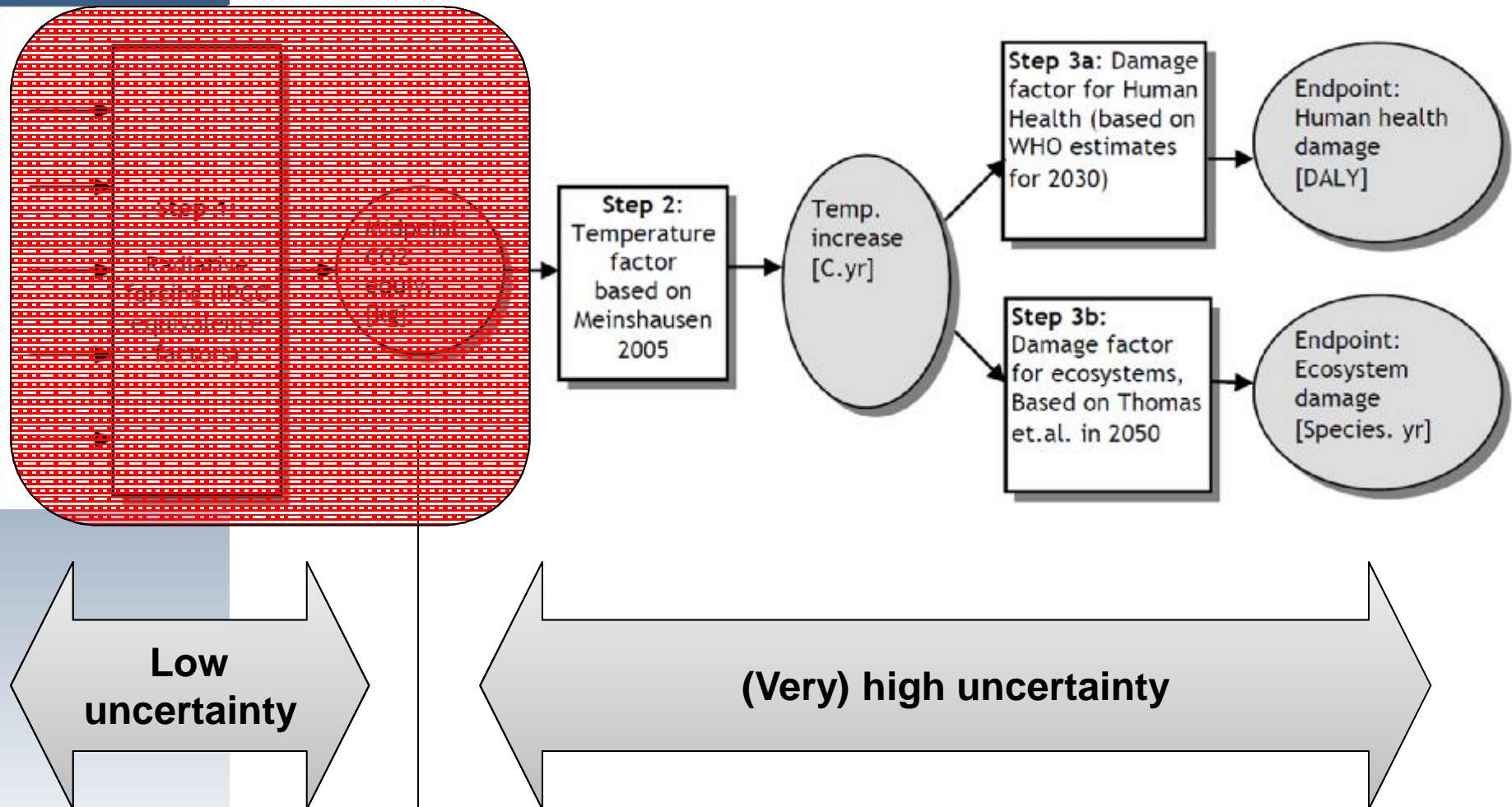
- Cradle to factory gate? Use phase?
- Upstream system boundaries?
- Rebound effects?



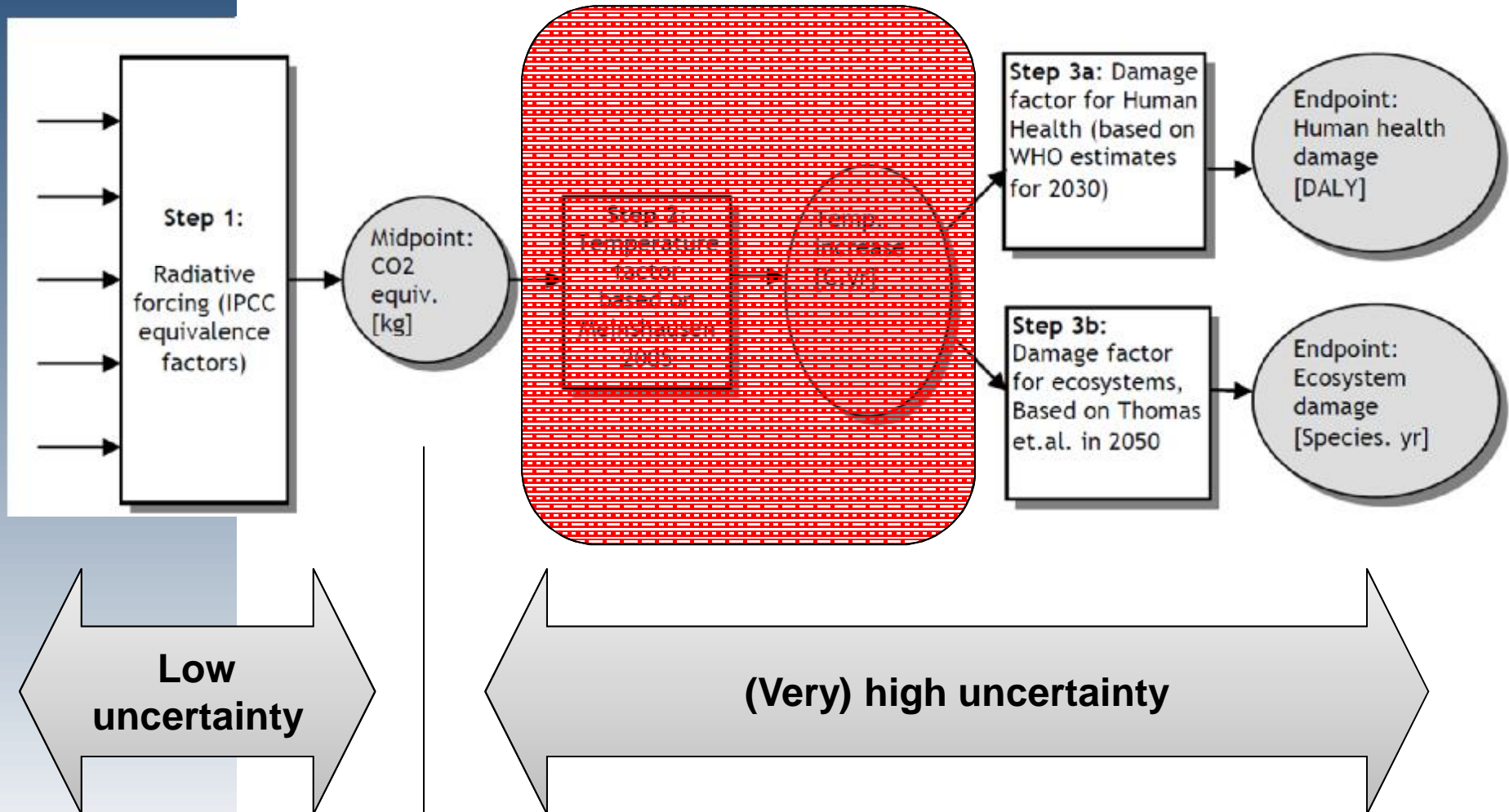




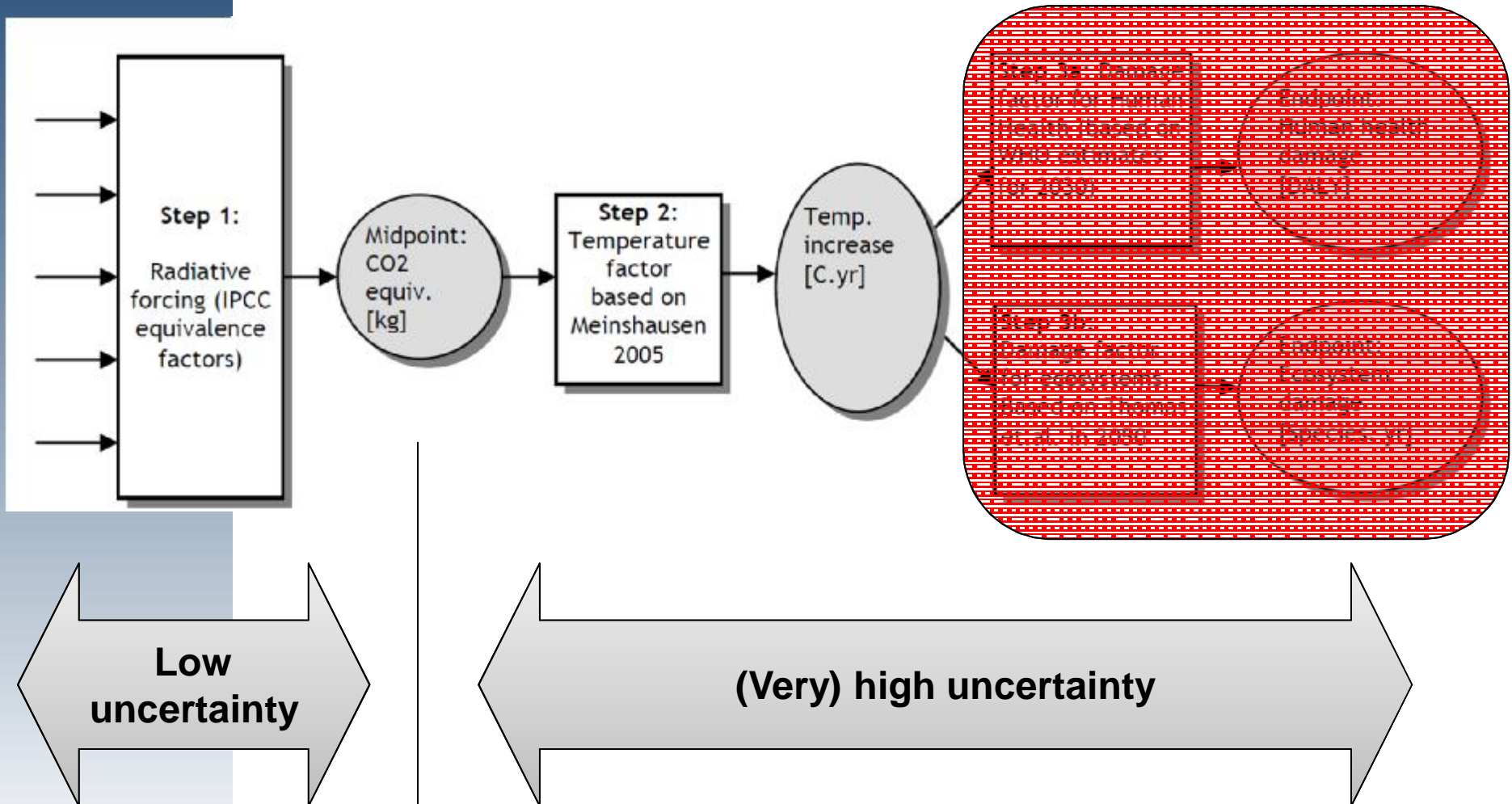




- Mid-point versus end-point



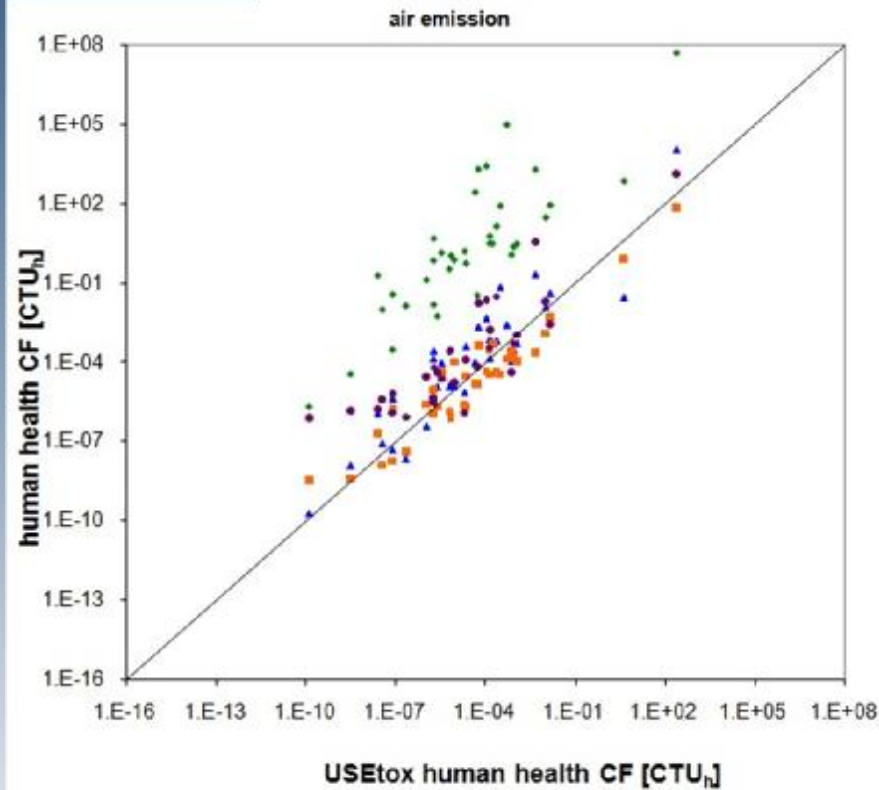
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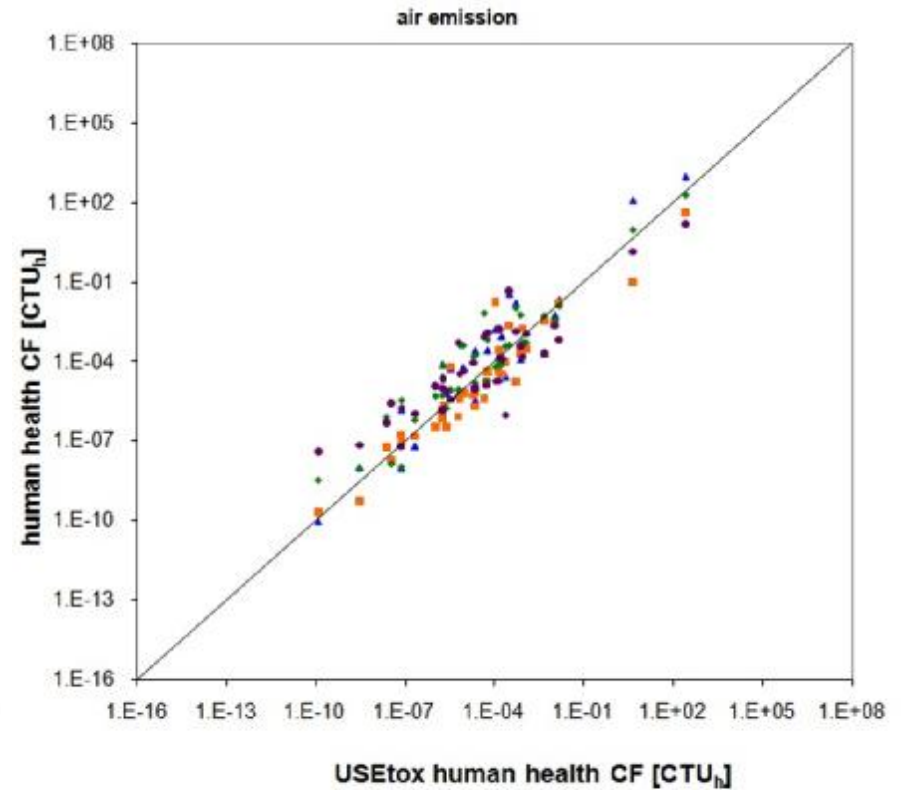
- Uncertainty?
- Toxicity and risk related aspects?
- Land use?
- Time and place dependency?



- Harmonisation of human health characterization factors



▲ IMPACT 2002 ■ USES-LCA ● CalTOX ◆ EDIP



▲ IMPACT 2002 ■ USES-LCA ● CalTOX ◆ EDIP

- Carbon footprinting?
- Social and economic aspects?





