



1° Convegno a cura del
Gruppo DIRE della Rete Italiana LCA
in collaborazione con SETAC ITALIAN BRANCH



Combined approach of Risk Assessment and Life Cycle Assessment for the environmental evaluations: an overview

Poster spotlight

Convegno “**Valutazioni di sostenibilità di tecnologie:
quale ruolo per l’LCA?**”

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	Life Cycle Assessment	Risk Assessment
APPROACH	“Less is better”, aimed at general prevention.	“Only above threshold”, aimed at risk minimization.
OBJECTIVE	Life-cycle perspective. “loading focus”	“receptor focused”
CONCEPTUAL MODEL	Emissions from the system to the environment (midpoint level) or to the final receptors (endpoint level).	Pollutant fate from emission sources to final receptors (endpoints).
IMPACTS ASSESSED	LCIA allows modelling of the environmental potential impacts for different categories, e.g. ozone-depletion, global warming, toxicity and eutrophication.	The assessment of the risks is related to the emission of substances at local or regional scales and to the toxicological and eco-toxicological impacts.
SPACE AND TIME FACTORS	As it works to systemic level, it is site independent, assesses the average situation, allows the environmental assessment at a global/regional scale of products/services throughout their life cycle.	It is strictly space and time dependent for a specific substance release.
FUNCTIONAL UNIT (FU)	Key concept: measure of the functional performance of the product system; basis for the comparison between products providing the same function; all data collected must be referred to it and the potential impacts are related to the FU of the technical system.	Emissions are expressed as total emissions in an environmental medium (soil, water or air) with volume known in order to obtain a concentration.

Approaches for integration of LCA and RA



Figure 1*. RA and LCA are separated (A) or overlapped (B).

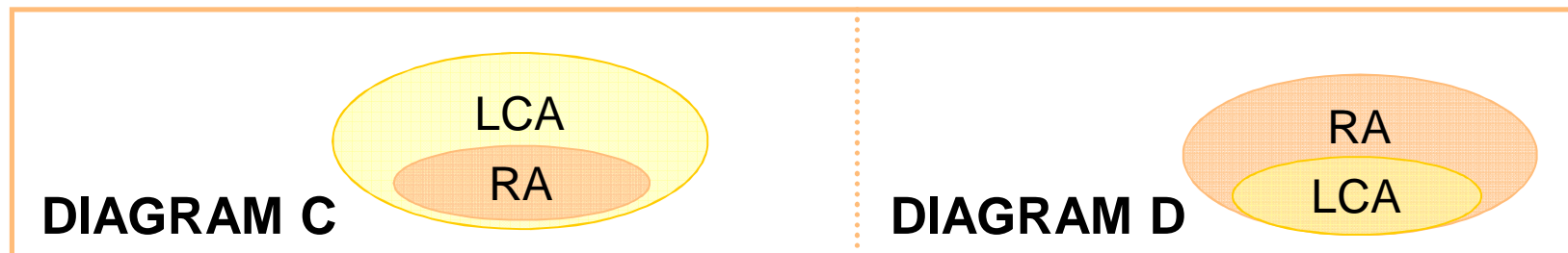


Figure 2*. RA as subset of LCA (C) or LCA as subset of RA (D).

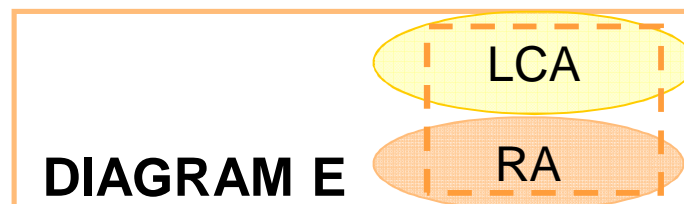


Figure 3*. LCA and RA are complementary (diagram E).

* adapted from Flemström et al [2004]



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Conclusion

LCA and RA, having different purposes and perspectives, **are often used separately** for quantifying potential impacts of products.

Inconsistencies between the results of the methods may be observed and also **limits** to their capability to obtain a definitive evaluation.

Nevertheless, **LCA and RA of products are indispensable tools for a more complete evaluation** of the impacts of a technological system on human and environmental health. **Their role is complementary and relevant in the decision making.**

Research is required for fostering a combined use that allows limits of both of them to be overcome.