



Definition of social indicators

A case study of an innovative technology

A. Zamagni¹, P. Buttol¹, O. Amerighi², B. Felici²,
R. Roberto¹, P. Masoni¹ - ENEA

¹*LCA&Ecodesign team*

²*Research&Studies Unit*

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Today's menu



- Problem definition: how to select indicators for a S-LCA applied to a new technology?
- Approach
- Case study: Technological system analysed
- Application of S-LCA framework
- Discussion
- Open questions

Problem definition



- Given an innovative technology, how to identify and select the most representative social indicators for assessing its social performance?
 - Is the S-LCA framework applicable also to innovative/new technologies?
 - Which knowledge do we gain from applying the S-LCA framework?
 - No final answer but elements for an open discussion

- S-LCA methodological framework (UNEP/SETAC Life Cycle Initiative)
 - Analysis of the stakeholders categories and of social indicators (methodological sheets);
 - Identification of indicators specific for the system under study
- Literature analysis of social indicators developed with other approaches
 - *Technology-oriented indicators* (Social acceptance (Social Impact Assessment framework, Assefa and Frostell 2007); Social compatibility (Carrera and Mack 2010))
 - *Product-oriented indicators*

Major issues in assessing social aspects



- Social aspects can be weighted in highly different ways depending on stakeholders, geographic contexts....;
- Data availability is quite poor and reliability is questionable;
- Complexity due to the important role played by qualitative aspects;
- Ambiguity exists in terminology, data and methods of measurement (Parris and Kates 2003).

Criteria adopted for the selection (Hirschberg et al. 2007)



- Scientific
 - Measurable and quantifiable, meaningful, non redundancy or double counting, sensitive and specific, etc.
- Functional
 - Relevant, possible to influence, comparable, comprehensive, etc.
- Pragmatic
 - Manageable, understandable, feasible, etc.

Technological system

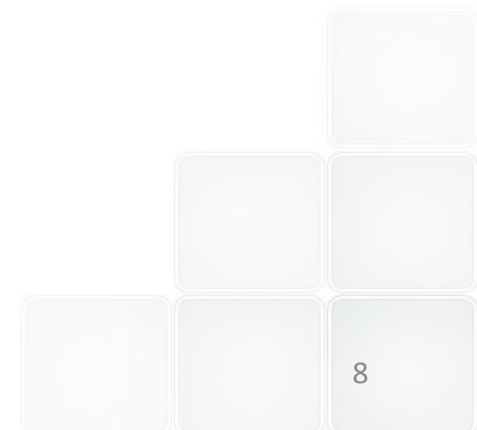


- Innovative tyre recycling technology, which produces SiC;
- Developed within the EU (7 FP) project TyGRE (*High added value materials from waste gasification residues*);
- One task devoted to the Life Cycle Sustainability Assessment (LCSA), as defined by Kloepffer (2008).
- For the S-LCA, same technological system defined for LCA study (in view of $SLCA = LCA + LCC + S-LCA$)

Assumptions adopted



- Geographical boundaries: Europe
- The demand of SiC is satisfied by the European production (no extra-EU players in the market)



Application of S-LCA framework



- 5 stakeholder categories (workers, local community, society, consumers, value chain actors)
 - 3 categories have been considered relevant for TyGRE: **workers**, **local community** and **society**
- Hot spot vs specific assessment ?
- Two levels of detail for indicators:
 - *Provisions* (what must be included, for the specific technology under study)
 - *Recommendations* (2nd level indicators, depending on the - geographical, cultural, etc. - context)

Stakeholder categories and indicators: provisions



Stakeholder category	Subcategory	Indicators	Quali/quant	Source
Workers	<i>Health and safety</i>	Potential risks on health and safety in the sector	quantitative	UNEP/SETAC
Local community	<i>Local employment</i>	Presence of local supply networks	semi-quant	UNEP/SETAC
		% of workforce hired locally	quantitative	UNEP/SETAC
		% of spending on locally-based suppliers	quantitative	UNEP/SETAC
	<i>Access to material resources</i>	Development of project-related infrastructure with mutual community access and benefit	qual/semi-quant	UNEP/SETAC
Society	<i>Quality of life</i>	Functional and aesthetic impact of technology infrastructure on landscape		NEEDS (adap.)
		Total traffic load	quant/semi-quant	NEEDS (adap.)
	<i>Contribution to economic develop.</i>	Nr of sectors involved in the life cycle	quantitative	ENEA
Society	<i>Contribution to economic develop.</i>	nr of markets involved	quantitative	ENEA
		<i>Technology develop.</i>	nr of patents and publication in scientific journals	quantitative
		research and development costs for the sector	quantitative	UNEP/SETAC

Stakeholder categories and indicators: examples of recommendations



Stakeholder category	Subcategory	Indicators	Quali/quant	Source
Workers	<i>Equal opportunities/Discrimination</i>	% foreign work	quantitative	UNEP/SEATC
		Ratio of basic salary of men to women by employee category	quant/semi-quant	
	<i>Professional development</i>	Enhancement of professional qualifications on the job	qualitative	PROSA
		Proportion of employees covered by training programmes	quantitative	PROSA

- The stakeholder « value chain actors not including consumers » might be relevant (subcat. Fair competition): further information are needed.
- Relevance of the stakeholder « workers » when the technology will be in place
- For a technology under development, the S-LCA helps in understanding what could potentially be relevant.
- The distinction provisions vs recommendations is useful to focus on the most relevant and feasible indicators

Some reflections



- Two levels of difficulties:
 - Technology under study
 - at this stage of technology development, no quantitative indicators.
 - Identification of the sector of reference
 - S-LCA framework
 - Indicators defined in the methodological sheets are not always applicable (either for specific or generic analysis)
- A company perspective is at the core of the UNEP/SETAC methodology: social impacts in terms of consequences on the system in which the technology is embedded are evaluated only to a minor extent.

Open questions



- Social indicators in S-LCA framework are not always appropriate for a technology. How can we deal with them?
- Could it be relevant to include a '*societal*' perspective (linked to the socio-economic repercussions and to the governance system)?
- Does the assumption of linearity adopted in LCA apply also in S-LCA?
- Does the size of functional unit matter in S-LCA?

Thank you for your attention

Alessandra Zamagni
LCA & Ecodesign team – ENEA
alessandra.zamagni@enea.it
+39 051 6098427