Definition of social indicators

A case study of an innovative technology

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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

Approach

- 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/quanti	Source
Workers	*Health and safety*	Potential risks on health and safety in the sector	quantitative	UNEP/SETAC
Local community	*Local employment*	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
	Access to material resources	Development of project-related inftrastructure with mutual community access and benefit	qual/semi-quant	UNEP/SETAC
	Quality of life	Functional and aesthetic impact of technology infrastructure on landscape		NEEDS (adap.)
		Total traffic load	quant/semi-quant	NEEDS (adap.)
Society	*Contribution to economic develop.*	Nr of sectors involved in the life cycle	quantitative	ENEA
		nr of markets involved	quantitative	ENEA
	Technology develop.	nr of patents and publication in scientific journals	quantitative	ENEA
		research and development costs for the sector	quantitative	UNEP/SETAC

Stakeholder categories and indicators: examples of recommendations

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

Discussion

- 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

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